THE

ENGLISH REVIEW,

For MAY 1790.

ART. I. *The Philoſophy of Natural Hiſtory. By William Smellie, Member of the Antiquarian and Royal Societies of Edinburgh.* 4to. 1l. 1s. boards. Edinburgh, printed: ſold by Cadell, London. 1790.

THE ſtudy of nature is the moſt delightful that can engage the attention of man. That beauty, that order, that ſymmetry, which run through the works of creation, ſooth the turbulence of paſſion, excite tender and placid emotions, and fill the feeling and contemplative mind with rapturous joy. Far different is the ſcene which human life preſents. Man, the tyrant of the univerſe, has violated the fair form of the world, and created confuſion, and anarchy, and vice. The introduction of property, the diviſion of ranks in ſociety, the amazing extenſion of arts and commerce, have deſtroyed the primæval manners, and contributed to the degradation of the human race. The ſtudy of life, however uſeful, is certainly diſguſting to an ingenuous mind, and has a manifeſt tendency to weaken the force of moral obligation. From this chequered picture we gladly return to a more lovely ſcene. Our diſpoſitions receive a tincture from our ſtudies and purſuits. The contemplation of nature attunes our ſouls to harmony. That univerſal ſyſtem of gradation, and that ſubordination of the parts to the whole, teach contentment with our ſituation, and reſignation to the Divine Will. We leave the habitation of groveling mortals, and, for a time, reſpire a purer air.

But the ſubject of natural hiſtory is locked up in foreign or dead languages, and obſcured with a farrago of barbarous names and indelicate illuſions. To explore theſe rich mines, and to extract and refine the coarſe ore, is to render an eſſential ſervice to mankind. The ſtudy is eaſy and attracting, and is equally accommodated to the youth of both ſexes. Several works of this kind have been compoſed; but they have been generally defective in method or elegance. Ray, in the end of laſt century, and Derham in the beginning of the preſent, publiſhed treatiſes of this popular nature; but the uncouth manner, the confuſed arrangement, and the unpoliſhed language, were equally forbidding, and their productions have fallen into oblivion. The Abbé Le Pluche was more ſucceſsful; his *Spectacle de la Nature* is even now read with conſiderable pleaſure. But the author is limited in his views, and extremely ſuperficial. The only good work of the kind, with which we are acquainted, is the *Contemplation de la Nature* of Bonnet; and it deſerves our higheſt commendation. It is at once clear, elegant, and profound. The author takes an ample range, and his views are extenſive, and ſometimes ſublime. His diction is ſmooth and perſpicuous, and through the whole he breathes an air of beneficence and piety.

We conſider the work now before us as a valuable preſent to the public. It furniſhes the moſt rational entertainment, and mingles, in a remarkable degree, the uſeful with the pleaſant. It contains information that is various, elegant, and important. The method of treating it is clear and natural. The language, though ſometimes perhaps diffuſe and nerveleſs, is, upon the whole, ſimple, correct, and perſpicuous. To novelty of facts, or originality of views, Mr. Smellie does not indeed pretend; but, in the ſelection of his materials, he diſplays judgment and taſte. Like his friend, the late ingenious Lord Kaims, he diſcovers a fondneſs for inveſtigating final cauſes; a diſpoſition which, though hardly conſiſtent with the cautious ſpirit of accurate philoſophy, gives a favourable turn to the mind, and is peculiarly pleaſing to youth. And in an age when a ſuperficial knowledge pervades every rank, we doubt not that this work will be read with avidity.

In the firſt chapter, Mr. Smellie conſiders the diſtinguiſhing characters of animals, plants, and minerals, and the analogies which ſubſiſt between them. The productions of nature aſcend by gradual and imperceptible ſteps. Thoſe claſſes which, at firſt ſight, appear to be ſo widely removed, are found, upon a cloſer examination, to be ſeparated by no preciſe and determinate boundary. Hence definitions are uſeleſs and futile. In every circumſtance plants, to a certain degree, reſemble animals. The ſtructure and irritability of parts, and the power of performing certain

certain motions, are in ſome meaſure common to both. The delicate ſhrink of the *ſenſitive plant* has long been the ſubject of wonder and ſurpriſe. The *moving plant*, a native of the Eaſt-Indies, is affected by the mere impulſe of the ſolar rays. During the night, or in cold and cloudy weather, it is ſtill and torpid; but when the ſun ſhines it is enlivened, and moves its leaves briſkly in all directions. The *Venus' fly-trap*, an American plant, is of a very ſingular kind. Its leaves are furniſhed with a double row of prickles, with which it ſeizes and tranſfixes the ſmall inſects that approach it.—The ſleep of plants is performed variouſly, and in a manner the beſt adapted to their particular ſtructure. The leaves of the *tamarind-tree* contract round the tender fruit, and protect it from the nocturnal cold. The leaves of the *chickweed*, the *ſwallow-wort*, the *orach*, &c. are diſpoſed in pairs, and during the night they riſe, join at the top, and conceal the flowers. The leaves of the *Indian mallow*, the *ayenia*, and the *tree-primroſe*, are placed alternately. Though horizontal, or even depending during the day, they riſe at the approach of night, and embrace the ſtem. In the ſame manner the *nightſhade*, and the *Egyptian vetch*, erect their leaves during the night. The young buds of the *white lupine* are protected by the pendulous ſtate of the leaves.—Plants have a ſingular power of accommodating themſelves to their ſituation, and of recovering their original poſition. In ſome inſtances they ſeem to be actuated by the principle of choice, and almoſt capable of reflection:

'When trees grow near a ditch, the roots which proceed in a direction that would neceſſarily bring them into the open air, inſtead of continuing this noxious progreſs, ſink below the level of the ditch, then ſhoot acroſs, and regain the ſoil on the oppoſite ſide. When the root is uncovered, without expoſing it to much heat, and a wet ſponge is placed near it, but in a different direction from that in which the root is proceeding, in a ſhort time the root turns towards the ſponge. In this manner the direction of the roots may be varied at pleaſure. All plants make the ſtrongeſt efforts by inclining, turning, and even twiſting, their ſtems and branches, to eſcape from darkneſs and ſhade, and to procure the influences of the ſun. Place a wet ſponge under the leaves of a tree, they ſoon bend downward, and endeavour to apply their inferior ſurfaces to the ſponge. If a veſſel of water be placed within ſix inches of a growing cucumber, in twenty-four hours the cucumber alters the direction of its branches, bends either to the right or left, and never ſtops till it comes in contact with the water. When a pole is placed at a conſiderable diſtance from an unſupported vine, the branches of which are proceeding in a contrary direction from that of the pole, in a ſhort time it alters its courſe, and ſtops not till it clings around the pole.'

Mr. Smellie proceeds to trace the analogy between plants and animals in the ſeveral points of *ſtructure* and *organs*, *growth* and *nouriſhment*, *diſſemination* and *decay*.

1. *Structure* and *organs*. An accurate and diſtinct account occurs of that ſingular being the *polypus*:

'His body conſiſts of a ſingle tube, with long *tentacula*, or arms, at one extremity, by which it ſeizes ſmall worms, and conveys them to its mouth. It has no proper head, heart, ſtomach, or inteſtines of any kind. This ſimplicity of ſtructure gives riſe to an equal ſimplicity in the economy and functions of the animal. The polypus, though it has not the diſtinction of ſex, is extremely prolific. When about to multiply, a ſmall protuberance or bud appears on the ſurface of its body. This bud gradually ſwells and extends. It includes not a young polypus, but is the real animal in miniature, united to the mother as a ſucker to the parent-tree. The food taken by the mother paſſes into the young by means of a communicating aperture. When the ſhooting polypus has acquired a certain growth, this aperture gradually cloſes, and the young drops off, to multiply its ſpecies in the ſame manner. As every part of a polypus is capable of ſending off ſhoots, it often happens that the young, before parting from the mother, begin to ſhoot; and the parent animal carries ſeveral generations on her own body. There is another ſingularity in the hiſtory of the polypus. When cut to pieces in every direction fancy can ſuggeſt, it not only continues to exiſt, but each ſection ſoon becomes an animal of the ſame kind. What is ſtill more ſurpriſing, when inverted as a man inverts the finger of a glove, the polypus ſeems to have ſuffered no material injury. M. Trembley, in the courſe of his experiments, diſcovered that different portions of one polypus could be ingrafted on another. He gave ſcope to his fancy, and, by repeatedly ſplitting the head and part of the body, formed hydras more complicated than ever ſtruck the imagination of the moſt romantic fabuliſts.'

Vegetables are, like animals, compoſed of a ſeries of veſſels. The bark conſiſts of the *cortex* or exterior covering, the *parenchyma*, a pulpy ſubſtance formed by a variety of *folliculi*, and the *liber* or rind, which, towards the end of autumn, coaleſces with the wood, and acquires the ſame conſiſtence. The pith is a congeries of air and ſap veſſels, interwoven like gauze. It continually diminiſhes, becauſe a part dries and incorporates with the general maſs. The wood conſiſts of a denſe compact *ligneous* matter, and a porous pulpy *parenchyma*. The ſame ſtructure extends through every part of a vegetable; and the roots, the branches, and the leaves, however unlike in appearance, are ſimilar in their texture. The aſcenſion of ſap is aſſiſted by capillary attraction, and the action of the air veſſels or *tracheæ*; but theſe cauſes are not alone adequate to the effect. The great ſource of motion is the principle of life inherent in vegetables, and which is excited and ſtimulated by the application of warmth.

The

The analogy between the circulation of the blood in animals is not indeed complete; for the ſap riſes vigorouſly in the day, when the plant is cheriſhed by the enlivening rays of the ſun, and again deſcends during the night. The pith of vegetables reſembles the ſpinal marrow and brain, the great ſeat of life. The leaves are expiratory organs, and ſupply the place of lungs. The branches, like the arms and *tentacula* of animals, ſerve for ſupport and defence. Bones, as well as wood, conſiſt of concentric layers. The graſſes differ conſiderably from other plants in their ſtructure. Their tubular and knotted form gives them ſtrength to reſiſt the violence of the wind. They reſemble the polypus and tænia. Succulent vegetables bear an analogy to worms, caterpillars, and ſoft inſects.

2. *Growth* and *nouriſhment*. Animals grow by *developement*, vegetables by *accretion*. Water is the principal food of plants; which is abſorbed by the fibres of the root, elaborated and converted into ſap, and then conducted, by numberleſs veſſels, to nouriſh the various parts. Seeds and embryos grow in the ſame manner. A part of the grain is converted, by the proceſs of vegetation, into a pulpy ſaccharine ſubſtance, which nouriſhes the infant plant, and the ſeminal leaves, by attracting air and moiſture, aſſiſt the expanſion. The age of animals admits of great variety. Plants are annual, biennial, triennial, and perennial. Warmth and moderate moiſture are equally favourable to vegetation and animal life. Some plants are confined to particular climates. The *arctic bramble* is only found in Norway and Canada. Others, as the *chickweed*, are diffuſed over the earth. The elephant is the native of warm regions, the reindeer inhabits only cold countries; but man is diſperſed through all the varieties of climate. The ruſh is an amphibious plant, the miſletoe a paraſite.—Acceſs of air and exerciſe are neceſſary to the health and vigour of vegetables as well as of animals. Plants, in confined ſituations, become weak, dwarfiſh, and pallid.

3. *Diſſemination* and *decay*. The diſtinction of animals into *oviparous* and *viviparous* is not ſufficiently marked. Some poſſeſs the power of generating in both ways; nor is the preſence of eggs always neceſſary to production. One ſpecies of *polypus* multiplies its kind, by ſending of ſhoots; another, by ſplitting longitudinally; another by dividing into tranſverſe ſections. The *dart-millepes* diſcharges its young, by a ſpontaneous ſeparation. The animalcules which appear in animal and vegetable infuſions, multiply *ad infinitum*, by continual diviſions and ſubdiviſions. The *vine-fretter* has been diſcovered to be capable of producing, without the influence of the male; and Bonnet has conducted the experiment through a ſucceſſion of nine gene-

rations. In the ſummer, this wonderful inſect is oviparous; but in autumn it depoſits its eggs on the bark and branches of the trees. Facts of this kind teach us to draw our concluſions with caution.—Eggs reſemble the ſeeds of plants. Both are inveſted with a hard cruſt. The rudiment of the future plant is concealed under the cicatrice of the ſeed, reſembling the *punctum ſaliens*, or living part of the egg. From theſe points veſſels are ſent out, in both, to abſorb the nouriſhment. Trees and ſhrubs, which produce by means of buds, may be conſidered as reſembling viviparous animals. In bulbous plants the root is obſerved, towards the end of autumn, to contain the plant in miniature. The *eyes* of potatoes remain torpid during the winter, but burſt forth into life by the genial influence of vernal warmth. The *water lentil*, a ſmall plant which covers ſtagnating pools, multiplies by detaching thin films from its leaf. Plants, like animals, have their ſeaſons of production. In northern climates, which enjoy a ſhort ſummer, the multiplication is rapid.—Some animals are capable of engrafting. Beſide the polypus, the *actinia*, or *ſea-nettle*, has the ſame ſingular property. Plants too, like animals, are ſubject to diſeaſe and decay. By exceſs of heat they become languid and ſhrivelled. Deprived of light and air, they become ſickly and lurid. An unfriendly ſoil, and a bleak expoſure, check their vigour and their growth. Age or accident puts a period to their exiſtence, and the mouldered veſtiges ſupply matter for the production of new generations.

In Chap. II, Mr. Smellie conſiders the *organs* and *ſtructure of animals*. He gives a very neat and clear view of the conſtruction and economy of the human body; and is thus enabled to inſtitute a compariſon, and mark the differences which ſubſiſt between it and thoſe of other animals. The degree of intelligence that is to be found in the brute creation correſponds to the ſimilarity of their ſtructure to that of man. In quadrupeds the uniformity of plan which runs through them all is wonderful. The variations ariſe almoſt ſolely from the difference of the proportions between the ſeveral parts. Immediately under the ſkin of quadrupeds, there is a thin muſcular ſubſtance, called *panniculus carnoſus*, by the ſudden ſhrinking of which they are enabled to drive off inſects. The carnivorous tribes are furniſhed with the weapons of deſtruction, and inherit diſpoſitions that are unſocial and cruel. Their ſtomach is ſmall, and their inteſtines ſhort. Their food runs into putreſcency, and is eaſily digeſted; and the *fæces* would prove hurtful from their acrid quality, if not ſpeedily diſcharged. Herbivorous quadrupeds are in general furniſhed with four ſtomachs, and their inteſtines are long, capacious, and convoluted. Their food is of a leſs nouriſhing quality, of more difficult digeſtion, and more tedious in

in the converſion into chyle. After maſtication the food is thrown into the firſt ſtomach, and, after concocting for ſome time, it is brought up and chewed, and again ſent into the ſecond; whence it ſucceſſively paſſes into the third and fourth. The external form of the herbivorous animals correſponds to their gentle diſpoſitions and mode of life. The ſhortneſs of their legs, and the length of their neck and head, enable them to paſture. They have no cutting teeth in the upper jaw, and are totally deprived of tuſks. They have no claws; and hoofs or horns are their only inſtruments of defence. Comparative anatomy informs us that man was not deſtined to feed upon vegetable or animal ſubſtances alone. He can ſubſiſt upon *either*, but the proper mixture of *both* is moſt conducive to the vigour of the conſtitution. In man and the quadrupeds, the circulation of blood in the fœtus is not complete. Inſtead of flowing through the lungs, it paſſes directly, by the *foramen ovale*, from the right auricle to the left. After birth, when reſpiration commences, this aperture completely cloſes. But, in the amphibious animals, the perforation is always entire, which gives them the power of ſuſpending the action of the lungs without inconvenience. The ſeal is remarkably gentle, and can be inſtructed to imitate various human actions. His manners are ſocial and affectionate. The young can diſtinguiſh the mother in a numerous troop, and readily obey her call. The elephant has only one ſtomach, but this defect is ſupplied by the extreme length of the inteſtines. This noble animal has been diſtinguiſhed in all ages by his ſize, his ſtrength, his ſagacity, and his ſteady affection. His trunk ſerves him inſtead of hands. He can lift the ſmalleſt piece of money from the ground, untie the knots of ropes, and open gates by turning the keys or puſhing back the bolts.

Mr. Smellie next proceeds to conſider the *ſtructure of birds*. Their external figure is admirably adapted to their mode of life. The wings are articulated with the breaſt-bone, and are furniſhed with muſcles of remarkable ſtrength. The tail ſerves as a rudder to direct their airy courſe. To diminiſh the reſiſtance of their motion their heads are ſmall, and terminated by long ſharp beaks: 'They are likewiſe deprived of external ears, and of protube-'rant noſes. Their tails, inſtead of vertebræ, muſcles, and 'ſkin, conſiſt entirely of feathers. They have no pendulous 'ſcrotum, no bladder, no fleſh uterus. Neither have they an 'epiglottis, though many of them poſſeſs great powers of mo-'dulation, and ſome of them may be even taught to articulate 'words. To lighten their beaks, they are deprived of lips and 'teeth; and their abdomen or belly is proportionally ſmall and 'narrow. Their feathers are inſerted in ſuch a manner as to

'lie backward from the head, and thus throw off the rain that 'might incommode them, and at the ſame time enable them to 'wing their courſe againſt the wind.' Birds are continually paſſing through buſhes and thickets; and Nature, to protect them from receiving injury, has furniſhed the *membranum nictitans*, which can be drawn over the eye like a curtain, and while it ſhades them from external violence, it admits light ſufficient to direct their courſe. Their rump terminates in a large gland, ſecreting an oily ſubſtance, with which they occaſionally anoint their feathers, and thus prevent the water from inſinuating. Birds are divided into the granivorous and the carnivorous. In the former claſs the œſophagus or gullet terminates in a membranous ſac, called the *ingluvies* or craw, where the food is macerated and partly diſſolved. It then paſſes into the *ventriculus ſuccenturiatus*, and, after receiving a farther dilution, it deſcends into the gizzard or true ſtomach, which conſiſts of two very ſtrong muſcles, covered externally with a tendinous ſubſtance, and lined with a thick, firm membrane. The lungs are red ſpongy bodies, attached to the back-bone, covered with a pervious membrane, and communicating with large veſicles that are ſpread over the whole abdomen. Theſe veſicles render the birds ſpecifically lighter, and ſupply the place of a diaphragm. In the male the teſticles are proportionably large, and communicate with two ſeminal ducts that terminate in the penis. In the female the cluſter of yolks is analogous to the human ovaria. The yolk paſſes into a canal called the *infundibulum*, where it receives a gelatinous liquor that compoſes the white. The uterus is a large bag ſituated at the end of the infundibulum; and here the egg receives its laſt covering, and is puſhed out of the vagina at an aperture placed immediately over the anus. This claſs of birds has a ſtrong analogy to the herbiborous quadrupeds. Their internal ſtructure is ſimilar, and their diſpoſitions are equally ſocial and gentle. The birds of prey have the ſame number of ſtomachs, though ſmaller and weaker; and, like thoſe of the rapacious quadrupeds, their inteſtines are ſhorter, and they can endure hunger for a great length of time. They are quick-ſighted; and thoſe that feed upon carrion have an exquiſite ſcent. As in this claſs the care of the young is intruſted to the mother, the females are larger, ſtronger, and more beautiful, than the males. Their diſpoſitions are ſullen and cruel. They retire to ſequeſtered rocks, or ſpend their lives in the ſolitary gloom of a foreſt. The feet of waterfowls are generally furniſhed with webs, which enable them to ſwim. Some feed upon the inſects that are found in the mud, and frequent marſhes and the margins of lakes and rivers.

They

They wade in ſearch of their prey, and, for this purpoſe, are furniſhed with tall naked legs and long necks and bills.

Structure and organs of fiſhes. Fiſhes are extremely various in their ſhape and ſize. The organ of ſmell is large; and that they poſſeſs the ſenſe of hearing has lately been completely demonſtrated. Their ſtomach is ſmall, and the guts ſhort. The ſwimming bladder is an oblong white membranous bag, contiguous to the backbone, and containing a quantity of air. They have the power of contracting or dilating it at pleaſure, and are thus enabled to riſe or deſcend in the water. In thoſe fiſhes that grovel near the bottom it is wanting. The heart is of a triangular figure, and has only one auricle, one ventricle, and one great artery, diſtributed entirely on the gills.

Mr. Smellie proceeds to conſider the *ſtructure of inſects*. Here nature ſports with variety, and the ſubject is uncommonly curious and difficult. Inſects have commonly ſix legs, but the number is often much greater. Their *antennæ*, or feelers, ſeem to aſſiſt them in groping, and examining the ſubſtances with which they meet. Their eyes are abſolutely immoveable; but this defect is ſupplied by their number. In a few inſects theſe are ſmooth; in others they are hemiſpherical, and compoſed of many thouſand diſtinct lenſes. It is not certain whether they poſſeſs the ſenſe of hearing, but it ſeems probable. The bodies of inſects conſiſt, in general, of a head, trunk, and abdomen. In ſome there are four or ſix *palpi* fixed to the mouth, which aſſiſt them in holding their food while eating. The moſt wonderful part of the hiſtory of inſects is, the metamorphoſes which the winged kind undergo. They iſſue from their eggs in the ſoft and moiſt ſtate of the worm or caterpillar. They are then transformed into the inanimate nymphs or chryſalids, and, after continuing ſome time torpid, they feel the influence of the returning heats of ſpring or ſummer, and burſt from their priſon in the form of beautiful flies. Mr. Smellie examines the inſects according to the arrangement of Linnæus, and ſelects the more remarkable ſpecies. 1. The *coleoptera*. This order includes the *ſcarabæi*, or beetle tribe. Theſe live for ſome time in the form of caterpillars or grubs, and feed upon roots or putrid matter. After transformation they change totally their habits, and ſome, that before feed voraciouſly upon dung and carrion, are nouriſhed with the pureſt nectareous juices, extracted from fruits and flowers. In ſome, the period of exaltation is of ſhort duration. The *ephemeron fly* lives three years a grub in the water. It exiſts only a day in the winged ſtate, depoſits myriads of eggs, and gives place to future generations. 2. *Hemiptera*. The whole of this order are furniſhed with a proboſcis or trunk for extracting their food. To it are referred the

the *cockroach*, the *bug*, the *cricket*, &c. The *fire fly*, a native of the tropical regions, emits a lively light during the night. 3. *Lepidoptera.* This order includes the butterflies and moths; and the individuals are diſtinguiſhed for their elegance and beauty. 4. The *neuroptera.* The wings of this order reſemble beautiful network. Their tail has no ſting; but the male is frequently furniſhed with pincers. In the *dragon-fly* the organs of the male are ſituated in the breaſt, thoſe of the female in the extremity, and, during coition, they have the appearance of a double animal. The *ſpring-fly* frequents ſtreams. Its caterpillar is in great requeſt among the fiſhermen, and known by the name of *ſtone* or *cod bait*. 5. *Hymenoptera.* 'In 'general the inſects belonging to this order have four mem-'branaceous and naked wings. In ſome of the genera, however, 'the neuters, and in others the males, or even the females, 'have no wings. Their tails, except in the male ſex, are 'armed with a ſting.' To this order are referred the *ant*, the *bee*, the *waſp*, &c. 6. *Diptera.* This order conſiſts of two-winged inſects. The caterpillars of the *gad-fly* lie concealed in the ſkins of cattle, where they are nouriſhed during the whole winter. This order includes alſo the *common fly*, the *gnat*, and the *horſe fly*. 7. *Aptera.* This order is compoſed of thoſe inſects that are not furniſhed with wings. It includes the *louſe*, the *flea*, the *ſpider*, the *ſcorpion*, &c. The laſt order is that of the *vermes*, or *worms*. The *hairworm* is common in our freſh waters, and, in this country, is perfectly harmleſs; but in Africa and both the Indies it is extremely noxious. It inſinuates itſelf into the naked feet or limbs of children and unwary perſons, and produces a dangerous inflammation. The *earth-worm* is hermaphrodite. It ſeems to feed ſolely upon fine earth. The *cuttle fiſh* is, in many reſpects, a ſingular animal. The *Meduſa* has the appearance of a lifeleſs maſs of jelly floating on the ſurface of the ocean; but, though the ſport of the waves, it is ſtill a gregarious animal.

Chap. III. treats of *reſpiration.* Upon this ſubject Mr. Smellie gives a view of the doctrines contained in Dr. Crawford's ingenious treatiſe on animal heat. It is found that air, which has aſſiſted in reſpiration, has its capacity for heat diminiſhed. Hence the principal ſource of vital warmth. The blood abſorbs the oxygenous part of the air; but whether it alſo evolves *carbone* is not yet decided. There is a remarkable circumſtance in the ſtructure of birds. The lungs communicate with air cells that are diſperſed over the whole body. The uſe of this arrangement is not yet well aſcertained. Some have imagined that the purpoſe of it was to expand the volume, and thus facilitate the aſcent of the bird. Mr. John Hunter ſuppoſes, with

with ſome probability, that the chief uſe is to avoid the inconvenience ariſing from the rapid flight, by furniſhing air when the action of the lungs is incommoded by the reſiſtance of the medium. Reſpiration ſeems to be, in a certain degree, neceſſary alſo to ſome fiſhes. Others have the power of extracting air from the element which they inhabit; either by decompoſing the water, or by ſeparating the gas which it contains. The organs of reſpiration in inſects are generally *ſtigmata*, or ſmall holes, ranged along the ſides in regular and beautifully dotted lines. If theſe be covered with any unctuous ſubſtance, the animal ſoon periſhes. Some inſects are furniſhed with *tracheæ*, which protrude from different parts of the body, and ſometimes have the appearance of tails. There is a ſpecies of aquatic worms, of a greeniſh brown colour, the bodies of which conſiſt of eleven rings, the laſt being open, and ſerving as a conductor of air. From this proceed a number of hairs, which are real feathers in miniature, and exclude water or mud, that might obſtruct reſpiration. Though air be, upon the whole, neceſſary to the ſupport of animals, yet they can continue for a great length of time in a ſtate of inaction, and without appearing to breathe. The facts with regard to the toad are very extraordinary. Three toads were lately buried in a box of earth, and, three months after, two of them were found ſtill alive:

'At the approach of winter, the toad retires to the hollow root of a tree, to the cleft of a rock, and ſometimes to the bottom of a ditch or pond, where it remains for months in a ſtate of ſeeming inſenſibility. In this laſt ſituation it can have very little communication with the air. But ſtill the principle of life is continued, and the animal revives in the ſpring. What is more wonderful, toads have been found, in an hundred places of the globe, incloſed in the heart of ſolid rocks, and in the bodies of trees, where they have been ſuppoſed to exiſt for centuries, without any apparent acceſs either to nouriſhment or to air; and yet they were alive and vigorous. In the Memoirs of the Academy of Sciences for the year 1719 we have an account of a toad found alive and healthy in the heart of an old elm. Another, in the year 1731, was diſcovered near Nantz, in the heart of an old oak, without any viſible entrance to its habitation. From the ſize of the tree it was concluded that the animal muſt have been confined in that ſituation at leaſt eighty or an hundred years. In many examples of toads found in ſolid rocks exact impreſſions of the animals bodies, correſponding to their reſpective ſizes, were uniformly left in the ſtones or trees from which they were diſlodged; and to this day it is ſaid that there is a marble chimney-piece at Chatſworth with a print of a toad in it, and a traditionary account of the place and manner in which it was diſcovered.'

Chap. IV. relates to *motion*. Motion, though the moſt familiar to our ſenſes, is obſcure and difficult, when conſidered in the abſtract. Mr. Smellie very properly waves the metaphyſical diſcuſſion of the ſubject. Motion may be divided into two kinds: that in which it originates in the body moved, and that in which it is derived from external action. The former includes the motions of animals, the latter thoſe of inanimate matter. The energy which we exert has its ſource in the brain and its ramifications, compoſing the nervous ſyſtem; and we are ſtimulated into action by the ſenſations made by the impreſſions of the objects around. But there are other motions, which are termed *vital* or *involuntary*, ſuch as the action of the heart, the periſtaltic motion of the bowels, &c.; in all which we are not conſcious of the operation of our will. The motions of animals vary with their weight, their ſtructure, their diſpoſitions, and their mode of life. Timid animals betray a reſtleſſneſs, and a continual flutter of action. Mr. Smellie ſelects ſeveral curious inſtances of animals which we would ſuppoſe from their ſtructure remain conſtantly at reſt, but which really perform a ſlow and painful motion. The muſcle tranſports itſelf by means of its tongue. It forms numberleſs viſcous threads, with which it can at pleaſure attach itſelf to the rocks, and reſiſt the agitation of its element. The razor-fiſh deſcends in the ſand, by the projection and incurvation of its leg. The oyſter retreats by ſuddenly and forcibly ejecting water. The motion of a ſpecies of Meduſa, or ſea-nettle, is as ſlow as the hour-hand of a clock:

'The *ſea-urchin*, or *ſea-hedgehog*, is round, oval, or ſhaped like a bias bowl. The ſurface of the ſhell is divided into beautiful triangular apartments, and covered with numberleſs prickles. Theſe triangles are ſeparated by regular belts, and perforated by a great number of holes. Each hole gives lodgment to a fleſhy horn, ſimilar to thoſe of the ſnail, and ſuſceptible of the ſame movements. Like the ſnail, the ſea urchin uſes its horns when in motion; but their principal uſe is to fix the animal to rocks, ſtones, or the bottom of the ocean. By means of the horns and prickles, which proceed from almoſt every point of the ſhell, the ſea-urchin is enabled to walk either on its back or on its belly. The limbs it moſt generally employs are thoſe which ſurround the mouth. But, when it chooſes, it can move forward by turning on itſelf, like the wheel of a coach.'

[*To be continued.*]

ART.

ART. II. *On the Principle of Vitality in Man, as deſcribed in the Holy Scriptures, and the Difference between true and apparent Death; a Sermon preached in the Pariſh Church of St. Andrew, Holborn, on Sunday, March* 22, 1789, *for the Benefit of the Humane Society. By Samuel, Lord Biſhop of St. David's.* 4to. 1s. Rivingtons. London, 1789.

IT is impoſſible to contemplate without pleaſure this great champion of the church againſt the inroads of Socinianiſm engaged in the benevolent office of preaching on the above occaſion. But neither the obligations we owe to his induſtry and learning, nor the high ſtation he ſo deſervedly fills, ſhould prevent our diſcharging thoſe duties the public has a right to expect of us. If therefore it ſhould appear to us that this able and eloquent divine reaſons better in polemics than on ſubjects of phyſiology, we ſhall not ſcruple to hazard our credit in ſo bold a conteſt.

After admitting that, on ſubjects of philoſophy not connected with religion, it is poſſible that an inſpired writer may have entertained erroneous opinions, or have accommodated himſelf to popular language, his lordſhip endeavours to ſhew that the compound nature of man, and the immateriality of the ſoul, are among thoſe ſubjects of poſitive revelation which a Chriſtian cannot but believe. This is a point we ſhall not take upon us to diſpute; though we cannot help doubting whether any of the terms by which the ſoul is deſcribed in holy writ neceſſarily imply its *immateriality*, how much ſoever they may teach us that its exiſtence is unconnected with the body. But the inquiry we would wiſh to make is, whether from ſcripture or from reaſon we learn any juſt conceptions of the *principle of vitality*; or, if we do, whether they will enable us to diſtinguiſh between true and apparent death.

The following is his lordſhip's account of the compound nature of man:

'But now let the divine be careful what concluſion he draw from this plain doctrine, and what notions he engraft upon it. Although we *muſt* believe, if we believe our Bible, that the union of ſoul and body is the firſt principle of animation in the human ſubject, it is by no means a neceſſary conſequence that the life of man is in no degree, and in no part, mechanical. Since man is declared to be a compound, the natural preſumption ſeems to be, that the life of this compounded being is itſelf a compound. And this experience and obſervation prove to be indeed the caſe. Man's life is compounded of the life of the intellect and the animal life. The life of the intellect is ſimply intelligence, or the energy of the intelligent principle. The animal life is itſelf a compound, conſiſting of the vegetable

vegetable life combined with the principle of perception. Human life therefore is an aggregate of at leaſt three ingredients; intelligence, perception, and vegetation. The loweſt and the laſt of theſe, the vegetable life, is wholly in the body, and is mere mechaniſm; not a mechaniſm which any human ingenuity may imitate, or even to any good degree explore; but the exquiſite mechaniſm of a Divine Artificer. Still it is mechaniſm; conſiſting in a ſymmetry and ſympathy of parts, and a correſpondence of motions conducive, by mechanical laws eſtabliſhed by the Creator's wiſdom, to the growth, nouriſhment, and conſervation of the whole. The wheels of this wonderful machine are ſet a-going, as the ſcriptures teach us, by the preſence of the immaterial ſoul; which is therefore not only the ſeat of intelligence, but the ſource and centre of the man's entire animation. But it is in this circumſtance only, namely, that the immaterial mover is itſelf attached to the machine, that the vegetable life of the body, conſidered as a diſtinct thing, as in itſelf it is, from the two principles of intelligence and perception, differs in kind (for in reſpect of excellence and nicety of workmanſhip all compariſon were impious; but in kind the vegetable life of the human body differs in this circumſtance only) from mere clockwork.'

Nothing can be more painful to us than not clearly to comprehend the arguments of a learned and ingenious writer. When we read that 'the life of the *intellect* is ſimply intelligence, and 'that the *animal* life is a compound of the vegetable life com-'bined with the principle of perception,' we are led to ſuppoſe that theſe laſt two are ſufficient for the ſupport of life diveſted of intelligence; and by the term mechaniſm, which is afterwards made uſe of, we are inclined to believe that this is his lordſhip's meaning. But it is afterwards added, 'The 'wheels of this wonderful machine are ſet a-going, as the ſcrip-'tures teach us, by the preſence of the immaterial ſoul.' If by this be meant that the body, being once ſet in motion by the ſoul, continues that motion without the aid of the latter, we can admit the propriety of the term uſed. But if the preſence of the ſoul be *always* neceſſary for the continuance of that motion, then either the body is not a machine, or the ſoul is a part of it. If it were neceſſary to illuſtrate this, we need only uſe his lordſhip's language, and obſerve that a clock, when ſet a-going by a man, continues, without *his* aid, its action afterwards for a time, according to the laws on which it is conſtructed, unleſs any of its parts are deranged. We are ready to admit the inference, that this mechaniſm is deſcribed as ſuch as no human ingenuity can imitate, but we mean to urge that it does not at all illuſtrate it—'Still it is mechaniſm; conſiſting 'in a ſymmetry and ſympathy of parts, and a correſpondence of 'motions conducive, by mechanical laws eſtabliſhed by the 'Creator's wiſdom, to the growth, nouriſhment, and conſer-

vation,

'vation, of the whole.' If this means that the arrangement of the different parts are beſt calculated for the above purpoſes, no man in his ſenſes will doubt it. If it means, as we ſuſpect, that without the aſſiſtance of the ſoul, all theſe purpoſes are brought about in other animals, and in vegetables; then either the ſoul is not neceſſary to ſet in motion the wheels of this machine, or animals and plants have a ſoul as well as man.

Setting aſide then the word machine, which, from its etymology and common acceptation, is ill applied to what no art can imitate, and what is no way the ſubject of mechanical principles, let us ſubſtitute the word organ, which, being a primitive word, is leſs liable to miſconception. Let us then aſk, whether any of the actions of this organ for the purpoſe of preſerving and ſupporting itſelf, are ſo different from the organiſation of other animals as to require a different mover; or if, as we are ready to admit becauſe ſcripture language implies it, the intelligent or immortal principle is different in man from thoſe organiſed materials; whether it neceſſarily follows that this principle ſhould be immaterial, when, by the above conceſſion, we ſee how far *common* matter is ſuſceptible of organiſation. And, laſtly, we leave it to his lordſhip's candour to determine whether the expreſſions he has ſelected from ſcripture, as deſcriptive of the ſoul, neceſſarily imply immateriality, how plainly ſoever they may deſcribe an exiſtence diſtinct from the body.

Having made thus free with the production of this learned prelate, it is but juſt, though hardly neceſſary, to obſerve that the reſt of the ſermon is admirably ſuited to the occaſion, and replete with ſound reaſoning and judicious obſervations.

ART. III. *The Firſt Principles of Chemiſtry. By William Nicholſon.* 8vo. 8s. London, 1789.

PERSPICUITY is the ſole merit of an elementary treatiſe; and the great object is to preſerve a clear, connected arrangement. The facts ought to ariſe naturally out of each other, and the mind ought to paſs ſmoothly along a chain of continued ſucceſſion. The phenomena muſt be gradually developed; ſimple and independent ſubjects muſt be firſt ſurveyed; and the effects of their various combinations will afterwards be perceived with facility. No branch of phyſics is perhaps more difficult to reduce to ſyſtem than the ſcience of chemiſtry; for the facts exiſt ſeldom independent, but are involved with collateral circumſtances. The preſent is the critical era of the ſcience. Its form has long been expoſed to fluctuation and change; and laboured hypotheſes have often periſhed in the inſtant

inſtant of their birth. A beam of light now burſts from all ſides; opinions, the offspring of an extravagant imagination, are conſigned to oblivion; and elegance and ſtability are given to the fabric. But to collect facts is the labour of the dull compiler; to introduce order and ſymmetry is the work of genius and diſcernment.

We are led into theſe reflections by the peruſal of the treatiſe before us. Our expectations are indeed diſappointed. The production is below mediocrity. To originality of matter, to clearneſs of method, to beauty of order, it has no pretenſions. The language is ſlovenly and inaccurate, and the arrangement is uncommonly confuſed. The author plumes himſelf in being able to compriſe the whole ſyſtem of chemiſtry in a ſingle volume. But ſmall is the merit of ſo paltry an abridgment.

The work is divided into two books: the firſt conſiders *general* chemiſtry, the ſecond *particular* chemiſtry. The author's definition of chemiſtry conveys no idea whatever: 'As a 'ſcience, its object,' ſays he, 'is to eſtimate and account the 'changes produced in bodies by motions of their parts, which 'are too minute to affect the ſenſes individually.' It is ſeldom that we meet with a ſentence ſo obſcure. Does he mean that the *parts* of bodies are too minute to affect the ſenſes; or that their *motions* are too minute to affect the ſenſes? To what does the word *individually* refer? Is it meant that one *ſenſe* alone receives the impreſſion; or that one *part*, or one *motion*, produces the ſenſation. If the ſentence has any meaning at all, it admits of four different applications. Beſides, the word *eſtimate*, in the preſent caſe, conveys no idea.—The author proceeds, in a curſory manner, to mention analyſis, ſyntheſis, elective attractions, &c. At once we are hurried into the midſt of the ſcience; and the effects of heat are ſtated before the term is explained. 'Heat expands ſolids, then renders them fluid, and afterwards 'converts them into vapour; and theſe changes ſucceed each 'other according as the intenſity of the heat is rendered greater.' This is, no doubt, very laconic; but unfortunately the laſt clauſe of the ſentence is nonſenſe.—In the ſecond chapter, the author begins more deliberately. He makes the common remark, that the word *heat* is employed either to denote the ſenſation itſelf, or the cauſe of that ſenſation. The effect is ſuppoſed by ſome to be produced by the internal vibration of the particles of bodies; by others it is imagined that the agent is a certain ſubtle fluid which is diffuſed through the univerſe. Some bodies are more eaſily heated than others in the ſame ſituation, and are therefore termed better *conductors of heat*. Whatever be the cauſe of heat, its general effect is to enlarge the dimenſions of bodies; and

and this expanſion is found to be nearly proportional to the additions of heat that are made. It has a tendency to an equal diffuſion; but it does not follow that all bodies of the ſame temperature contain it in equal quantity; for ſome are more ſuſceptible of its effects than others. Hence the diſtinction into *abſolute* and *relative* heat. The denſities of heat in different bodies in a ſimilar expoſure, are termed their *capacities for heat.* The capacity may be eſtimated from the change of temperature obſerved in mechanical mixture. Some philoſophers have aſcertained it by the quantities of ice, which different bodies, at the ſame temperature, were able to melt. Water has a greater capacity for heat than ice, and ſteam a ſtill greater than water. Hence ariſe the effects of evaporation and frigorific mixtures.

In Chap. III. Mr. Nicholſon treats particularly of the thermometer, and gives directions for the conſtruction and examination of it, and concludes with the rules for converting the degrees of Farenheit's into thoſe of Reaumur and Celſius. He next explains, in a curſory manner, the various operations of chemiſtry; calcination, fuſion, cementation, digeſtion, diſtillation, &c. and gives a ſhort deſcription of the more common apparatus. Our author then conſiders the mode of operating upon elaſtic fluids, deſcribes the eudiometer, and Dr. Nooth's elegant apparatus for impregnating water, and ſtates the improvements which have been made in collecting the aerial products in diſtillation.

The next chapter is allotted to the conſideration of weights and balances; a ſubject of great importance in nice chemical experiments. The delicacy of a balance is indicated by the ſlowneſs of the vibrations of the beam. The accuracy which has been introduced is quite aſtoniſhing. Mr. Bolton had a balance, which, when loaded with a pound, would turn with the tenth of a grain. One made for Dr. George Fordyce is affected by the $\frac{1}{384,000}$ of the weight; and the balance lately made by Mr. Ramſden for the Royal Society can aſcertain a weight to the *ſeven millionth part!* The firſt part of the work concludes with ſome remarks upon the inertia of matter, gravity, elective attraction, ſolution, cryſtalliſation, &c. The author ſeems fond of the ſilly notion of the polarity of particles.

Mr. Nicholſon proceeds, in the ſecond book, to conſider particular chemiſtry. He ſpeaks of light as if the doctrine were founded entirely upon conjecture. 'It is generally '*taken for granted*,' ſays he, 'that light is a ſubſtance, or 'an emanation of particles of prodigious minuteneſs, which are 'projected in right lines, with extreme velocity, from lumi-'nous bodies; and that they are repelled from all bodies at

'certain diſtances, and at leſs diſtances attracted, ſo as to pro-
'duce all the effects of reflection, refraction, and inflection, in
'the rays they compoſe.' What a ſtrange inconſiſtent medley of words and ideas! He then ſlightly mentions the notion affixed by the chemiſts to the word phlogiſton, and Mr. Kirwan's ſuppoſition that it is the ſame with hydrogenous gas. He next conſiders combuſtion, the abſorption of oxygen gas, the production of this gas, the nitrous teſt, the hydrogenous gas, the compoſition of water, and the effects of the eoliple. After this rapid view of the aerial fluids, he deſcends to treat of the primitive earths. He conſiders the alkalis, relates the proceſs for the manufacture of glaſs and ſoap, and mentions the general properties of the mineral, vegetable, and animal acids. Mr. Scheele deſcribed a proceſs for extracting foſſil alkali from ſea ſalt. Mr. Turner triturates litharge with water and half its weight of common ſalt, till it aſſumes a white colour, and then allows the mixture to ſtand for ſome hours. The alkali is diſengaged, and the marine acid unites to the calx of lead, and forms a yellowiſh green pigment, the ſale of which is the principal object of the manufacturer. He next ſurveys the metals; mentions the diviſion into perfect and imperfect, their calcination, cryſtalliſation, ſolution, &c. and the oppoſite theories which have been formed on theſe ſubjects.

Mr. Nicholſon now returns to examine more minutely what he had before ſlightly touched. He details the properties of vitriolic acid and ſulphur, and their various changes and combinations. This acid is generally obtained by burning a mixture of eight parts of ſulphur with one of nitre, in a large veſſel lined with lead, and containing a ſmall portion of water to abſorb the fumes.—He next conſiders a very intereſting ſubject, that of the nitrous acid; the formation of nitre beds, the extraction and purification of the ſalt, its deflagration and detonation, the compoſition of gunpowder, the *pulvis fulminans*, &c. the diſtillation of the acid, its formation, its effect upon animal ſubſtances and the eſſential oils; and ſlightly explains the oppoſite theories which have been offered. The marine acid occupies the next chapter. The ſea contains, he ſays, between the tropics, from an eighth to an eleventh of its weight of ſalt. This is a miſtake; for in no part of the world does the quantity exceed one twentieth. He relates the various methods of extracting the ſalt, and of cryſtalliſing it. The diſtillation of the acid, and the various compounds that it forms, are next conſidered. The oxygenated marine acid is of a ſingular nature; and its property of inſtantly deſtroying colour, has been directed with advantage to the bleaching of wax and linen. The power of *aqua regia* to diſſolve gold is probably derived from the extemporaneous pro-

duction of oxygenated marine acid. Our attention is next turned to the carbonic gas, and thoſe ſubſtances and proceſſes which contribute to its formation, the calcareous matters, fermentation, and the combuſtion of charcoal. Its acidulating quality, and its combination with earths and alkalis, are mentioned. The acid of borax comes next to be conſidered; its production, its purification, its analyſis, its properties. The acid of amber has lately been examined, but its properties are not remarkable.

Mr. Nicholſon next treats of the phoſphoric acid, a ſubject on which ſo much light has lately been thrown. It abounds in animal ſubſtances, it occurs in the cruciform plants, and it is even found in the mineral kingdom. It is ſometimes combined with the ores of lead; and to iron it communicates the *cold-ſhort* quality; an unfortunate circumſtance for the manufacturers of this country. Both phoſphorus and its acid are now obtained with eaſe from bone aſhes. The acid is always formed by the union of oxygen with the phoſphorus, and may be procured in greater purity by the inflammation of the phoſphorus, by the ſpontaneous decompoſition ariſing from expoſure, or by the action of nitrous acid. Phoſphorus diſſolves in oils and ardent ſpirits, and communicates to them a luminous appearance. The ſolution in ſome of the eſſential oils has the property of ſpontaneous inflammation, when expoſed to the air. A ſtick of phoſphorus, plunged into the ſolutions of gold, ſilver, copper, and other metals, is gradually covered with a brilliant metallic ſheath. The phoſphoric acid combines with all the alkalis. Other acids have lately been examined, the theory of which is ſcarcely yet aſcertained. The acids of arſenic, molybdena, and turgoten, obtained from the ores.

Mr. Nicholſon then proceeds to the conſideration of the metals. The malleability and ductility of gold is quite aſtoniſhing. It is unalterable in the ſtrongeſt heat of our furnaces. It is, however, volatiliſed in the focus of powerful burning-glaſſes, and partially calcined. The electric exploſion converts it into a purple calx. Gold is ſoluble alone in *aqua regia* and oxygenated muriatic acid. By a careful evaporation the ſolution yields fine cryſtals of a topaz colour. It is precipitated by the earths and alkalis, and even by the addition of martial vitriol, and forms a yellowiſh or purpliſh powder. The precipitate made by volatile alkali or ſal ammoniac is termed *aurum fulminans*, becauſe, when gently heated, it explodes with aſtoniſhing violence. The volatile alkali, which unites to the calx, is ſuddenly decompoſed; the oxygen combines with the hydrogenous gas and forms water, while the azotic gas is inſtantly extricated. Hence the vitriolic acid, oils, æther, &c. which detach the volatile alkali, deſtroy the fulminating quality. If gold be

precipitated from *aqua regia* by means of tin, we obtain the *purple powder of Caſſius*, which is uſed as an enamel. Gold is not acted upon by nitre or the alkalis. It diſſolves, however, in the *liver of ſulphur*. It combines moſt readily with mercury. Hence the proceſs of water-gilding.—Silver comes next to be conſidered. It is fixed in the heat of common furnaces; but, expoſed in the focus of a powerful lens, it fumes and vitrifies. It is tarniſhed by the influence of the air; and the ſcales which are formed, during a courſe of years, upon ſilver images, are found to be a compound of that metal with ſulphur. Silver diſſolves in all the mineral acids. The ſolution in nitrous acid yields thin cryſtals, which are called *lunar nitre*; and theſe, when fuſed, form *lunar cauſtic*. The affuſion of marine acid produces *luna cornea*, which is difficultly ſoluble, and is thrown down. Heated with fixed alkali, it yields the pureſt ſilver. A curious diſcovery has lately been made by the ingenious M. Berthollet. He diſſolves pure ſilver in pale nitrous acid, and precipitates it from the ſolution by the addition of lime-water. He dries the calx by expoſing it to the air for three days. He next ſtirs it in a ſolution of cauſtic volatile alkali till it becomes a black powder; he then decants the fluid, and leaves it to dry. This is *fulminating ſilver*. The experiment requires to be conducted with the utmoſt caution. The ſlighteſt agitation occaſions an inſtantaneous and dreadful exploſion. The theory is the ſame with that of fulminating gold. Mercury ſeparates ſilver from its ſolutions extremely ſlowly. The precipitate aſſumes fanciful forms, and ſometimes reſembles the ramifications of a tree; and hence is termed by the alchemiſts *arbor Dianæ*.—The new metal, platina, is next conſidered; it is the denſeſt of all the metals. It has, in common with iron, the ſingular property of welding. It is precipitated from the ſolution in *aqua regia* by ſal ammoniac, which diſtinguiſhes it from the other metals. It is not affected by the Pruſſian alkali; and this circumſtance is the foundation of the method of ſeparating it from iron, with which it is commonly combined. Platina forms with copper a compound that admits of a fine poliſh, and is not ſubject to tarniſh; and hence it has been uſed for the mirrors of reflecting teleſcopes. Mr. Nicholſon next mentions the properties of mercury, its various compounds and preparations. Lead is the next in order. It is precipitated from its ſolutions by the liver of ſulphur. If lead be heated with charcoal and phoſphoric acid, the acid is converted into phoſphorus, and combines with the metal. The compound, in its appearance, reſembles lead. By the aſſiſtance of heat, lead decompoſes ſal ammoniac, and diſengages the volatile alkali. Litharge, fuſed with common ſalt, unites to the marine acid, and forms a yellow pigment. A mixture of eight

parts

parts of biſmuth, five of lead, and three of tin, will melt in a heat hardly ſufficient to cauſe water to boil. Copper decompoſes ſal ammoniac by diſtillation. It unites with ſulphur, and forms the *æs veneris*, which is uſed by dyers and callico printers. Copper unites alſo with phoſphorus. It has a ſtrong attraction for tin; and hence is founded the proceſs for tinning copper veſſels. Hence alſo the compoſition of bronze and of reflecting ſpeculums. Mr. Edwards has lately made an improvement on this ſubject. We ſhall tranſcribe the account.

'He firſt melts thirty-two parts of copper as fluid as poſſible, 'with one part of braſs and one of ſilver, together with the black 'flux; at the ſame time that fifteen parts of tin are melted in a 'ſeparate crucible by itſelf. Theſe being taken from the fire, he 'pours the tin to the copper, immediately ſtirs the whole toge-'ther with a wooden ſpatula, and pours the whole out haſtily into 'a large quantity of cold water, which cools and granulates the 'compoſition. If the tin were fuſed together with the copper, 'or if they were to remain for any length of time in the extreme 'heat which is neceſſary to fuſe this metal, a part of the tin 'would be calcined, and the metal would abound more or leſs 'with ſmall microſcopic pores. If one of the pieces of the cold 'metal be broken, it will appear of a moſt beautiful bright colour, 'reſembling quickſilver. Mr. Edwards affirms that different kinds 'of copper require different doſes of tin to produce the moſt 'perfect whiteneſs. If the doſe of tin be too ſmall, which is the 'fault moſt eaſily remedied, the compoſition will be yellow; if it 'be too great, the compoſition will be of a grey blue colour, 'and dull appearance. He therefore finds, by trial, the quantity 'of tin neceſſary to be added in the ſecond fuſion to render the 'metal the moſt perfect. A much leſs heat is then required to 'melt the compound. In the ſecond melting he adds one part of 'arſenic, and immediately ſtirs the mixture, which he pours into 'the mould as ſoon as the fumes of the arſenic have ceaſed to 'ariſe. He caſts the ſpeculum in ſand, with the face downwards; 'takes it out while red-hot, and places it in hot wood-aſhes to 'cool; without which precaution it would break in cooling.'

Mr. Nicholſon now proceeds to conſider the moſt uſeful of all the metals, iron. He relates its properties and various combinations with tolerable accuracy; the production of ink, Pruſſian alkali, &c. He properly obſerves that the compound of iron and ſulphur, neither of the ingredients containing water, might perhaps furniſh data to decide which of the oppoſite ſyſtems in chemiſtry is founded in nature. The author deſcribes the different ſtates in which iron is found, and the methods employed for analiſing the ores and extracting the metal. Iron decompoſes ſal ammoniac by the aſſiſtance of heat, and the

calx produces the ſame effect in the common temperature. He explains the proceſs of converting it into ſteel, and gives an account of the theories which have been lately formed upon the ſubject.—Tin is next in order. It diſſolves in concentrated vitriolic acid, and, by abſorbing oxygen from the acid, converts it into ſulphur. By long ſtanding, or the effuſion of water, a white calx is thrown down. When tin is diſſolved in nitrous acid, volatile alkali is formed. The water is decompoſed, the oxygen calcines the metal, while the hydrogen joins the azote furniſhed by the acid, and compoſes the alkali. The ſolution of tin in *aqua regia* is uſed by the dyers to convert a crimſon colour into a bright ſcarlet. Tin decompoſes ſal ammoniac. With ſulphur it forms the curious maſs named *aurum muſivum*. If the cryſtals of nitrous copper be groſsly powdered, moiſtened, and roiled up in tin-foil, the ſalt deliqueſces, nitrous fumes are emitted, the maſs becomes hot, and ſuddenly takes fire. The ſemi-metals come next to be conſidered. Biſmuth, diſſolved in nitrous acid, ſubſides when the ſolution is diluted with water, in the form of a fine white calx, which is termed the *magiſtery of biſmuth*, and uſed as a coſmetic. The properties of nickel are ſlightly mentioned. Arſenic is a ſubject of more importance, and is treated with greater diffuſion. The calx of cobalt is employed to give the fine blue tinge to glaſs. The ſolution of cobalt in *aqua regia* forms ſympathetic ink, the characters made with which diſappear when dry, but, expoſed to the fire, they become of a fine green, and again loſe the colour by removal. Zinc is a ſemi-metal, diſtinguiſhed by its extreme inflammability. It burns with a dazzling flame, rapidly calcines, and ri es in white flowers, termed *philoſophical wool*. When the calx is urged by a ſtrong heat, it is converted into a yellow glaſs. Zinc, fuſed with vitriolated tartar, abſorbs the oxygen from the acid and forms *liver of ſulphur*. If pulveriſed, it detonates violently with nitre. Zinc decompoſes alum, common ſalt, and ſal ammoniac. It is generally obtained by diſtilling its ore, calamine, with charcoal, and is known in the arts by the name of *ſpelter*. The calx of antimony enters readily into the compoſition of glaſs, and communicates a hyacinthine tinge. The ſemi-metal detonates with nitre, and forms *diaphoretic antimony*. It partly converts vitriolated tartar into liver of ſulphur. The regulus combined with ſulphur is named *crude antimony*. Emetic wine is formed by infuſing powdered glaſs of antimony in white wine. Tartar emetic is a compound of tartar and the calx of antimony. The calx of manganeſe unites in fuſion with earths and ſaline ſubſtances, and communicates a deep red or purple tinge. The colour is heightened by the degree of calcination; and hence inflammable matter diſcharges it, but the addition of nitre

again

again reſtores it. The ore of manganeſe, known in Derbyſhire by the name of *black wadd*, is remarkable for its ſpontaneous inflammation with oil.—Tungſten, or wolfram, is a metal lately diſcovered, the properties of which are not well aſcertained; nor is it certain whether it be not a natural compound. Molybdena is diſtinguiſhed from black-lead by its ſhining ſcaly appearance. It is very ſcarce, and has not been much examined.

Mr. Nicholſon next proceeds to enumerate the combuſtible minerals. Theſe are inflammable air, hepatic air, naptha, petroleum, Barbadoes tar, aſphaltum, mineral tallow, jet, pit-coal, peat, turf, amber, ſulphur, and plumbago. He properly obſerves that moſt of theſe are really animal and vegetable productions, which have undergone various modifications in the bowels of the earth. The diamond alſo muſt be referred to the claſs of combuſtible minerals; for it has been lately diſcovered that, in an intenſe heat, it is totally conſumed, and leaves not the ſmalleſt trace.

Mr. Nicholſon now begins the conſideration of the vegetable kingdom. He makes ſome general remarks upon the functions of organiſed beings, and gives a ſhort account of the various vegetable productions; mucilage, ſugar, ſtarch, gluten, fat oils, eſſential oils, camphor, reſins, the aromatic principle, and the colouring matter.

We have next a tolerably diſtinct view of the ſaline ſubſtances obtained from vegetables. Lemon-juice may be preſerved for ſome time under a thin ſtratum of oil. In the Eaſt-Indies it is evaporated to the conſiſtence of a thick extract. But the beſt method is to congeal the watery part by expoſing it to a cold ſeven or eight degrees below the freezing point. To obtain the acid in its greateſt purity, the lemon-juice ought to be boiled with chalk, and the compound ſalt thus formed decompoſed with vitriolic acid. Another acid, that of apples, is procured by ſaturating the ſour juice with vegetable alkali, adding ſugar of lead, and treating the precipitate with vitriolic acid. The acid of galls is evolved by maceration in water. Ardent ſpirit does not affect the mucilaginous part, but diſſolves the ſalt; and if this ſolution be evaporated, ſmall brilliant cryſtals of a grey yellowiſh colour are obtained. The acid of benzoin is extricated by boiling that fragrant reſin in lime-water, and treating the ſolution with marine acid. The cream of tartar is a compound of vegetable alkali. The acid is obtained in fine cryſtals, by the addition of vitriolic acid and ſlow evaporation. Or lime may be added to the cream of tartar, when the acid will remain in the ſolution, and ſelenite thrown down. The ſalt of ſorrel is an acid obtained by cryſtalliſing the expreſſed juice of the wood-ſorrel and other plants of ſimilar properties.

Some acids are expelled from vegetables by the application of fire; others are obtained by treating them with nitrous acid. The number of theſe have lately been diminiſhed; and it is probable that they are all capable of being converted into each other.

Mr. Nicholſon next proceeds to conſider fermentation, putrefaction, &c. and the production of ardent ſpirit. He deſcribes the proceſs for obtaining æther by treating ſpirit of wine with the vitriolic acid, the nitrous, the marine, the acetous, the phoſphoric, &c. He enumerates the properties and combinations of diſtilled vinegar. He then paſſes to conſider the animal ſubſtances, milk and its products, wax, lac, ſilk, &c. the blood, the bile, the mucilage, &c.

Several uſeful tables are added in an appendix. The comparative heats of different bodies, the weights of different countries, the ſpecific gravities of bodies, ſimple and double elective attractions, and the proportion of the ingredients in earth and ſtones.

In ſhort, we do not refuſe Mr. Nicholſon the merit of a laborious compiler. In no part of his work does he ſeem to exerciſe his own judgment. He has collected a number of facts, but he has deſcribed them in a manner equally confuſed and inelegant. His general views are extremely lame and ſuperficial. Through the whole, he draws his explanations of the phenomena from the oppoſite theories which have been propoſed; and this circumſtance, joined to ſtudied conciſeneſs, involves the ſubject in greater darkneſs. The learner will derive little benefit from the peruſal of the work, and the man of ſcience will treat it with contempt.

ART. IV. *Surgical Tracts, by the late J. O. Juſtamond, F. R. S. Surgeon to the Weſtminſter Hoſpital; conſiſting of, I. Outlines of the Hiſtory of Surgery, from the earlieſt Antiquity of the Art, pointing out the particular Improvements, and fixing them where due. II. An Eſſay on Inflammation and Abſceſs, with their proper Modes of Treatment in different Parts of the Body. III. A Diſſertation on the Effects of Motion and Reſt, and their Application to the Purpoſes of Surgery; from the French Prize Memoir by M. David, with copious additional Annotations on the original Text. IV. Obſervations on Counter-ſtrokes, and an Account of their various Conſequences, Treatment, &c. from the ſame. V. On the Methods employed in treating Cancerous Diſeaſes, including Remarks on the Cure of Indurations of the Breaſt. The whole collected and interſperſed with occaſional Notes and Obſervations by William*

William Houlſton, Member of the Corporation of Surgeons, Fellow of the Society of Antiquaries, and of the Medical Society of London. 4to. 15s. boards. Cadell. London, 1789.

THESE Tracts are the poſthumous productions of one who had acquired a degree of diſtinction in the practice of ſurgery, and who blended with the exerciſe of his profeſſion a variety of literary avocations. Though far from being deſtitute of utility to young ſurgeons, they are publiſhed chiefly from motives of a very different nature, and ſuch as muſt always excite the attention of the benevolent part of mankind. The author, amidſt the moſt flattering proſpects of ſucceſs, had experienced the ſhock of adverſity, and was torn for ever from his neareſt connexions before it was in his power to replace them in the ſituation from which he had fallen. Poſthumous works are always particularly entitled to the candour of criticiſm; the juſtice of which, however, ought never to be violated, even from the moſt tender conſiderations. We ſhall therefore give a ſhort and impartial account of the tracts now before us.

The firſt contains Outlines of the Hiſtory of Surgery, from the remoteſt period down almoſt to the preſent time. In this narrative the author has very properly ſeparated the hiſtorical occurrences of ſurgery from thoſe which relate to the medical art in general; a diſtinction uſually omitted by writers on the ſubject, though particularly neceſſary in the modern hiſtory of two profeſſions. The narrative differs, in ſeveral chronological points, from that of preceding writers, and is detailed with great perſpicuity.

Next follows an Account of the Qualifications neceſſary to form a good Surgeon. Theſe, according to our author, are youth, firmneſs, dexterity, acute ſenſation, ſound judgment, and humanity. By youth he means that period of life when the body and mind may be ſaid to enjoy their full vigour; for he thinks there is a time when, if a man is deſirous to preſerve the reputation he has acquired by long and extenſive practice, he ſhould lay aſide the knife, and content himſelf with ſuperintending the operations of others. The author illuſtrates the ſeveral qualifications above ſpecified with much preciſion, and makes many pertinent obſervations which are worthy of attention.

The Eſſay on Inflammation and Abſceſs, though little diſtinguiſhed by any new obſervations, affords ſtrong proof of the author's judgment, and knowledge in his profeſſion; which induce us to regret that he has not treated of ſome of the ſubjects more copiouſly. His account of the whitloe and its ſeveral diſtinctions, with the reaſons for the treatment recommended, may juſtly be conſidered as highly valuable to young ſurgeons.

As

As a ſpecimen of the work, we ſhall inſert the author's obſervations on the two mildeſt ſpecies of whitloe:

'The firſt ſpecies is ſituated round the nail, immediately under the cuticle or epidermis. It is in general a diſeaſe of little conſequence, but may be made troubleſome by ill treatment.

'It begins by forming a little ſwelling, attended with a degree of redneſs, and ſome pain at one corner of the nail. A linen compreſs dipped in ſpirit of wine and camphor, applied moderately tight round the finger, and kept conſtantly moiſt, very frequently proves ſufficient to cure the complaint in a few hours, and prevent the formation of matter. I knew a lady who was very ſubject to frequent attacks of this diſeaſe. She had been taught always to treat it with the good old woman's remedy, a bread and milk poultice, and by this means the complaint frequently laſted a fortnight, and proved extremely worrying and troubleſome. I directed her, as ſoon as ſhe felt the leaſt pain in the finger, to dip the part and wrap it up in ſpirit of wine and camphor. By this management ſhe never afterwards had a whitloe that proceeded to ſuppuration.

'But if, notwithſtanding theſe precautions, matter ſhould ſtill make its appearance, which it generally does at firſt by one white ſpot under the cuticle, we muſt not delay cutting off the cuticle from that ſpot immediately, and from every part of the finger where it is raiſed. The application of a piece of rag, wet in the Goulard water, and renewed when dry, is then ſufficient to cure the diſeaſe in four-and-twenty hours. But if, on that evening, we delay opening the cuticle, which is eaſily ſeparated from the ſubjacent ſkin, it becomes looſened by the matter, which extends perhaps round the finger, and ſometimes a conſiderable way down it, and, what is worſe, deſtroys the adheſion of the nail to the cuticle from which it is produced. Hence there is a neceſſity for caſting off the old nail, and conſequently waiting for the growth of a new one, which makes a tedious and troubleſome diſeaſe of one that would have been well in a few hours if properly treated at the outſet. We ſee therefore, even in the moſt trifling caſes, how much miſchief may be prevented by a little timely attention and obſervation.

'The ſecond ſpecies of whitloe is ſeated immediately in or under the cutis, in the adipoſe membrane about the end of the finger.

'The inflammation being greater here, and alſo the pain, from the greater ſenſibility of the parts concerned, the diſeaſe becomes of a little more conſequence. There is a ſtrong throbbing and pulſation in the part, and a conſiderable elevation of the ſkin. We may attempt to diſperſe this abſceſs by immerſing the finger, for half an hour at a time, in warm water, and by keeping rags, wet with the ſaturnine water, conſtantly applied to the part; but if theſe attempts ſhould fail, the ſooner the matter finds an iſſue outwardly the better; every thing, therefore, that tends to remove the obſtacle to the exit of the matter, ſhould be ſpeedily attempted. The cuticle in theſe parts is very thick, and it often happens that the matter ſhall have got through the ſkin, and ſhall not be able to make its way through the epidermis; for the natural thickneſs of the cuticle is here increaſed by

by the inflammation, and by the practice of ſoaking the part conſtantly in a bread and milk poultice. This is evident to the ſenſes; forthe cuticle becomes white and perfectly opaque, reſembling that of waſherwomen who have been ſoaking their hands all day in water.

'In ſlight caſes of this ſort I have known the ſeparating of the lamellæ of the cuticle from each other, or, in other words, the thinning of the cuticle, prove ſufficient to afford an outlet, either at the time or in a few hours after, to the matter, and to cure the diſeaſe. In ſeveral inſtances, where there exiſted an evident tumour, with no fluctuation, but, from all appearances, a tendency to ſuppuration, I have ſucceeded in preventing farther miſchief by plunging a knife into the prominent part through the ſkin and fat; which effect, I imagine, can only have been produced by unloading the veſſels of the part, in the ſame manner as topical bleeding cures inflammation.'

The next eſſay is a Diſſertation on the Effects of Motion and Reſt. It is an ingenious memoir, and faithfully tranſlated by Mr. Juſtamond, who has ſubjoined to it a number of uſeful annotations. The author firſt explains the effects of motion and reſt, and afterwards points out the indications which are to lead the practitioner in preſcribing motion or reſt reſpectively in ſurgical diſorders.

The tract immediately following is likewiſe a tranſlation from the French, explaining the effects of counter-ſtrokes on the ſeveral parts of the body, and the method of relieving them. It is probable that, had Mr. Juſtamond lived longer, he would have furniſhed this treatiſe alſo with uſeful annotations, which an extenſive knowledge of the ſubject had fully enabled him to ſupply.

The concluding treatiſe, on the Trial of certain Remedies for the Cure of Cancers, &c. is a republication of one of Mr. Juſtamond's former productions. It evinces great judgment, as well as obſervation, on the treatment of thoſe obſtinate diſorders.

From the whole of theſe tracts Mr. Juſtamond's abilities, as a ſcientific and well-informed ſurgeon, appear to unqueſtionable advantage; and were there wanting any proof of his induſtry in the improvement of chirurgical knowledge, it is amply exhibited in this collection of detached eſſays, which we are glad to ſee reſcued from oblivion by the laudable attention of the preſent editor, and the generous co-operation of the ſubſcribers towards the publication of the work.

ART.

ART. V. *The Poor Soldier; an American Tale: founded on a recent Fact. Inſcribed to Mrs. Creſpigny.* 4to. 2s. 6d. Walter, London, 1789.

THIS poem, the production of a female pen, has ſeveral claims at leaſt to a ſprig of Parnaſſian bays. If the deſign of the poet to expand the boſom to all the feelings of benevolence by teaching us to ſeek for objects every where; to relate the hiſtory of a virtuous ſufferer; and laſtly to pay ſome tribute to the amiable exertions of her patroneſs; be in itſelf commendable, we may aſſure our readers theſe are not the only merits of the performance. Many poetical deſcriptions, ſome degree of imagery, and a mind warmly engaged in the ſubject, are diſcoverable in every part; nor is there a want of ſomething like the order and arrangement neceſſary to the ſtructure of a poem. In what then is it deficient? We might ſay in adhering to truth in the firſt inſtance; and next in too ſtrictly conforming to thoſe rules which are conſidered as eſſential to diſtinguiſh poetry from proſe. An ingenious writer, whoſe works we have lately reviewed with much pleaſure, places this diſtinction in the excluſion of all abſtract ideas from the language of poetry. We were much pleaſed with this definition, but are now obliged to add, that the ſubject of a poem may come ſo near to common life, as not eaſily to admit a very familiar and exact detail of circumſtances. The Poor Soldier is an American loyaliſt, who, after ſuffering the loſs of his property and family in America, comes to England in hopes of being received into Chelſea hoſpital. His ſubſequent calamities to his death make the remainder of the poem. The beſt contrived parts are the ſcenes in America, which, not being familiar to Engliſh readers, admit of that cloſe detail which can alone render poetry intereſting. The following deſcription of a modern ſkirmiſh and a rally, are as poetical as the ſubject will admit, without diveſting it of truth:

> 'Now, front to front, our hoſtile legions ſtand,
> And anxious wait the ſignal of command.
> Barbaric war-whoops pierce the echoing ſky,
> Provincial trumpets louder ſtill reply;
> While, by the deep-mouth'd cannon's thundering ſound,
> Ear thrilling yells and martial blaſts are drown'd.
> A bloody ſtrife enſues—Death's iron car
> Triumphant ranges o'er the field of war.
> Long time doth fortune equal hold the ſcale,
> But England's mighty arms at laſt prevail:
> Rebellion's ſons in broken ranks retire,
> Save on one ſpot, where, with heroic fire,

A brave

A brave provincial wakes the ſlumbering zeal
Of every private for the public weal.
'Yield not, my friends! (the *rebel-patriot* cries;)
Your bleeding country on your aid relies!
O ſave her liberty, preſerve her laws,
Or greatly fall in Freedom's glorious cauſe!'
'He ceas'd—the rebel train his words obey,
And boldly follow where he leads the way.
'Twas mine to ſtop th' intrepid warrior's courſe;
But vain my efforts, vain my utmoſt force!
Till, hurl'd from Indian hands, a whirring dart
Reſiſtleſs came, and pierc'd his manly heart—
He reel'd—he fell—and, gaſping ſore for breath,
Faintly exclaim'd, 'I die a glorious death!
Yield not, my countrymen!—our foes retire—
Nor, with your chief, let Freedom's cauſe expire!'

If we contraſt this with the deſcription of Felicia going to the war-office in order to gain a ſettlement for her protegé, we ſhall ſee how difficult it is to give familiar objects a poetic air:

'Thus buſied, to that pile Felicia came
Which from barbaric war derives its name.
She ſtops—and to the martial office goes,
Where, with kind zeal, ſhe pleads her veteran's woes
To one whoſe open brow proclaims a ſoul
Pliant to gentle Pity's ſoft control:
This youth—but wherefore, muſe, neglect to breathe
A name that merits Honour's brighteſt wreath?
(If active warm Benevolence may plead
A ſacred title to that envied meed;)
Randole thus anſwers ſtraight the anxious fair:
'To gallant Howard, Chelſea's chief, repair,
Since he, and he alone, can grant thy pray'r.'
'Alas! I know him not' (Felicia ſighs);
'Yet ſeek him, lady, (ardent Randole cries).
He joys the friendleſs ſoldier to relieve;
He bids the child of ſorrow ceaſe to grieve;
For ſweet philanthropy, angelic gueſt!
Hath fix'd her empire in his noble breaſt.'
'Thus urg'd, Felicia heſitates no more;
But inſtant bends her courſe to Howard's door;
Yet vain her ſpeed—the chief is far away—
But learning that the next revolving day
Chelſea's brave rulers will in council meet,
The fair, with warmeſt charity replete,
Reſolves thoſe baſhful feelings to control,
Which oft o'erwhelm with dread the female ſoul,
And, in the virtue of her motive bold,
Before the chiefs her ſtory to unfold.'

We

We obſerved before that the poem is regularly conſtructed; that is, it begins in the middle of the hero's hiſtory, and he is afterwards introduced as relating the earlier parts of it to Felicia, who, meeting him in the ſtreet, very benevolently intereſts herſelf in his behalf. But by theſe means Felicia is ſo conſtantly before us that we almoſt loſe ſight of the principal character. We mean not to detract from the merits of this lady, or the propriety of marking ſo amiable a character to the world; but the poem is entitled the Poor Soldier, and we muſt not deviate from Horace's rule:

Denique ſit quidvis, ſimplex
Duntaxat et unum.

On the whole, therefore, whatever merit we may admit to many parts of this performance, we are obliged to confeſs either that the ſubject would not admit of poetic ornaments, or that the poet has been too often unhappy in her choice of them.

ART. VI. *Philoſophical Tranſactions of the Royal Society of London, Vol. LXXVIII. For the Year* 1788. *Part II.* 4to. 8s. 6d. ſewed. Davis. London, 1788.

Art. XIV. OBSERVATIONS on the Natural Hiſtory of the Cuckoo. By Mr. Edward Jenner. In a Letter to John Hunter, Eſq. F.R.S. This paper is curious and entertaining. The facts, though extraordinary, ſeem to be well authenticated. The more we contemplate the works of Nature, we are the more aſtoniſhed at that wonderful inſtinct which directs her creatures:

'The firſt appearance of cuckoos in Glouceſterſhire (the part of England where theſe obſervations were made) is about the 17th of April. The ſong of the male, which is well known, ſoon proclaims its arrival. The ſong of the female (if the peculiar notes of which it is compoſed may be ſo called) is widely different, and has been ſo little attended to, that I believe few are acquainted with it. I know not how to convey to you a proper idea of it by a compariſon with the notes of any other bird; but the cry of the dab-chick bears the neareſt reſemblance to it.

'Unlike the generality of birds, cuckoos do not pair. When a female appears on the wing, ſhe is often attended by two or three males, who ſeem to be earneſtly contending for her favours. From the time of her appearance, till after the middle of ſummer, the neſts of the birds ſelected to receive her eggs are to be found in great abundance; but, like the other migrating birds, ſhe does not begin to lay till ſome weeks after her arrival. I never could procure an

an egg till after the middle of May, though probably an early-coming cuckoo may produce one ſooner.

'The cuckoo makes choice of the neſts of a great variety of ſmall birds. I have known its egg entruſted to the care of the hedge-ſparrow, the water-wagtail, the titlark, the yellow-hammer, the green linnet, and the whinchat. Among theſe it generally ſelects the three former; but ſhews a much greater partiality to the hedge-ſparrow than to any of the reſt: therefore, for the purpoſe of avoiding confuſion, this bird only, in the following account, will be conſidered as the foſter-parent of the cuckoo, except in inſtances which are particularly ſpecified.

'The hedge-ſparrow commonly takes up four or five days in laying her eggs. During this time (generally after ſhe has laid one or two) the cuckoo contrives to depoſit her egg among the reſt, leaving the future care of it entirely to the hedge-ſparrow. This intruſion often occaſions ſome diſcompoſure; for the old hedge-ſparrow at intervals, whilſt ſhe is ſitting, not unfrequently throws out ſome of her own eggs, and ſometimes injures them in ſuch a way that they become addle; ſo that it more frequently happens that only two or three hedge-ſparrow's eggs are hatched with the cuckoo's than otherwiſe: but whether this be the caſe or not, ſhe ſits the ſame length of time as if no foreign egg had been introduced, the cuckoo's egg requiring no longer incubation than her own. However, I have never ſeen an inſtance where the hedge-ſparrow has either thrown out or injured the egg of the cuckoo.'

The ſubſequent part of the paper affords a ſtrong inſtance of the partial conduct of Nature. The individual ſuffers pain for the benefit of the whole; and one part of the ſyſtem is ſupported by the deſtruction of another. The young hedge-ſparrows are turned out of their maternal habitation, and left cruelly to periſh. It is their foſter-brother that performs the unnatural deed. The fact is curious and almoſt paradoxical. The little animal contrives to get the bird upon its back, clambers up the ſide of the neſt, and throws it out with a jirk. When it is two or three days old it is reſtleſs and uneaſy, and makes extraordinary exertions to exclude its rivals.

The egg of the cuckoo is ſmall, reſembling the houſe-ſparrow's, and weighs from forty to fifty grains. No more than one is depoſited in the ſame neſt. The chirp of the young cuckoo is plaintive; nor does it ever acquire the adult note during its ſtay in this country. It feeds upon various inſects and ſeeds. A ball of hair of the ſize of a pea, and curiouſly wound up, is often found in its ſtomach. In this, as well as its early ferocity, it reſembles a bird of prey.

Mr. Jenner promiſes to give a paper upon the migration of birds, which muſt be extremely acceptable.

Art. XV. Of the Temperament of thoſe Muſical Inſtruments in which the Tones, Keys, or Frets, are fixed, as in the Harpſichord,

Harpſichord, Organ, Guitar, &c. By Mr. Tiberius Cavallo, F. R. S. Theoretical writers on muſic have involved the ſcience in an air of myſtery. We are glad to find Mr. Cavallo treat the ſubject with his uſual ſimplicity and perſpicuity. The diviſions of the diatonic ſcale are well known. If the whole length of the muſical chord be reckoned 1, the firſt note or C will be ſounded by a portion as 1; the ſecond or D by $\frac{8}{9}$; the third or E by $\frac{4}{5}$; the fourth or F by $\frac{3}{4}$; the fifth or G by $\frac{2}{3}$; the ſixth or A by $\frac{3}{5}$; the ſeventh or B by $\frac{8}{15}$; and the octave or c by $\frac{1}{2}$. To theſe ſimple ſeven ſounds the muſicians have ſince added five intermediate notes, which are termed flats or ſharps. Theſe are, the ſecond minor $\frac{15}{16}$, the third minor $\frac{5}{6}$, the fourth major $\frac{32}{45}$, and the ſeventh major $\frac{5}{9}$. The octave can be made the key, and the other notes formed by the proportional ſubdiviſion. The fifth alſo, being expreſſed by a ſmall fraction, ſerves ſometimes for the foundation of a ſcale which is termed the occaſional key. Theſe fundamentals give riſe to two ſeries of notes which never exactly coincide. The neareſt intermediate notes are taken, and the correction which muſt be applied is termed *temperament*. Seven octaves are nearly equal to twelve fifths; for $(\frac{2}{3})^{12}$ is nearly $= (\frac{1}{2})^7$. The exact value of $(\frac{1}{2})^{\frac{7}{12}}$ is 1,498, &c. and the whole chord, being divided by this number, will give the firſt tempered fifth, and this again the ſecond tempered fifth, and ſo on. Mr. Cavallo actually tempered a monochord in this way, and tuned a harpſichord by it, which, on whatever key it was played, was harmonious throughout.

Art. XVI. Deſcription of a new Electrical Inſtrument capable of collecting together a diffuſed or little condenſed Quantity of Electricity. By Mr. Tiberius Cavallo, F. R. S. Mr. Cavallo, in a former paper, has pointed out the defects of the inſtruments hitherto propoſed for examining ſmall quantities of electricity. In the preſent he propoſes an inſtrument which ſeems liable to few objections. The principle is the ſame with that of Volta's electrophorus. To the ſhorter ſides of a flat tin plate, thirteen inches long and eight broad, are ſoldered two tin tubes, which are open at both ends. Two glaſs ſticks covered with ſealing-wax, by means of heat are cemented into theſe, and ſupport the plate in a vertical poſition. Two frames of wood are faſtened to the bottom boards by means of braſs hinges, and may be placed parallel and at the diſtance of one fifth of an inch from the tin plate. The application of the inſtrument is eaſy.

Art. XVII. On the Converſion of a Mixture of dephlogiſticated and phlogiſticated Air into nitrous Acid, by the electric Spark.

Spark. By Henry Cavendiſh, Eſq. F. R. S. and A. S. The beautiful experiment in which Mr. Cavendiſh converted into nitrous acid a mixture of the oxygenous gas and atmoſpheric air, by paſſing through it repeated electric ſparks, is delicate and laborious. Several philoſophers upon the continent have tried to repeat it, but without ſucceſs. Mr. Cavendiſh therefore directed the experiment to be performed before ſome of the principal members of the Royal Society, and thus completely aſcertained his important diſcovery. Atmoſpheric air and oxygenous gas from turbith mineral, were confined in a bent glaſs tube by columns of ſoap-lees and quickſilver. As the acid was gradually formed, it was abſorbed by the ſoap-lees, and produced nitre. The oxygenous gas ſeems to be rather more than double of the azotic in the compoſition of nitre.

Art. XVIII. Experiments on the Effect of various Subſtances in lowering the Point of Congelation in Water. By Charles Blagden, M. D. Sec. R. S. and F. A. S. Dr. Blagden has proſecuted this ſubject with minute accuracy. He has made ſeveral curious remarks with regard to the appearance of the cryſtals formed, the tranſparency of the ſolutions, &c. which we cannot abridge. It appears that, if we denote the proportional quantities of certain ſalts diſſolved in water by n, the point of congelation of the ſolutions will be expreſſed by theſe ſimple formulæ: Common ſalt $32° - n \times 112°$, nitre $32° - 48° \times n$, ſal ammoniac $32° - 120° \times n$, Rochelle ſalt $32° - 22° \times n$, ſal cathartic amarus $32° - 16° \times n$, green vitriol $32 - 10° \times n$, white vitriol $32° - 10° \times n$. Theſe experiments ſeem to confirm the principle of De Luc, that the greateſt cold produced by a mixture of any ſalt and ſnow is the ſame with which a ſaturated would freeze. After water has taken up as much of one ſalt as it can diſſolve, it is ſtill capable of diſſolving a portion of a ſecond, or even of a third ſalt. Dr. Blagden has found that the compound effect of theſe, in ſinking the freezing point, is nearly equal to the ſum of the depreſſions which they could make if they were ſeparately applied. Thus a ſolution of $\frac{1}{18}$ of Rochelle ſalt, $\frac{1}{10}$ common ſalt, and $\frac{1}{17}$ ſal ammoniac, congealed at 13°. The ſeparate effects are, of the Rochelle ſalt $\frac{22}{18}° = 2°,2$, common ſalt $\frac{112}{10}° = 11°,2$, ſal ammoniac $\frac{120}{17} = 7°$. The ſum of theſe depreſſions is 20°,4, or at the point 11°,6, which nearly agrees. Hence the important fact, that ſnow produces a more intenſe cold with a mixture of ſeveral ſalts than with a ſingle ſalt. Hence alſo the frigorific powers of compound ſolutions. This has been noticed in the Memoirs of the French Academy of Sciences ſo far back as 1700; but it has lately been revived and extended.

Dr. Blagden next relates the reſult of his experiments upon certain ſubſtances which, by equal additions, depreſs the freezing point of water in an *increaſing ratio*. Vitriolic acid, whoſe ſpecific gravity was 1,837 at 62°, congealed at 32°—98°×*n* nearly; ſmoking nitrous acid, whoſe ſpecific gravity was 1,454, at 32°—106°×*n*, nearly; muriatic acid of 1,163, at 32°—80°×*n*, nearly; ſalt of tartar 32°—54°×*n*, nearly; mineral alkali, 32°—21°×*n*; volatile alkali 32°—68°×*n*; ſpirit of wine, of the ſpecific gravity 829, at 32°—70°×*n*. Water begins to expand at the temperature of 40°; and it appears that an addition of ſalt reduces the expanſion to 8° above the depreſſed point of congelation.

Art. XIX. Additional Experiments and Obſervations relating to the Principle of Acidity, the Decompoſition of Water and Phlogiſton. By Joſeph Prieſtley, LL.D. F.R.S. With Letters to him on the Subject, by Dr. Withering and James Keir, Eſq. This paper contains ſome additional remarks upon the experiment which this ingenious philoſopher made by inflaming a mixture of the oxygenous and hydrogenous gaſes. The quantity of acid produced was ſo *ſmall* that the doctor was at a loſs to decide its *ſpecies*. His philoſophical friends examined the liquor by various teſts, and found it to be *nitrous* acid. We have already ſhewn, we hope, that this *minute* portion of acid is derived from the *impurity* of the gaſes, and that the experiment does not affect the theory of Lavoiſier. Phlogiſton is the *proteus* of the *conſtitutional* chemiſts. It is a phantom which aſſumes various ſhapes, according to the fancy of the inquirer. Many phenomena, indeed, can be well explained by both ſyſtems. In the one there is an *abſtraction*; in the other an *accumulation*. But the theory which is formed upon the continent poſſeſſes a clearneſs, a preciſion, and an elegance, which ſet it upon a firm baſis.

Art. XX. On the Probabilities of Survivorſhips between two Perſons of any given Age, and the Method of determining the Values of Reverſions depending on thoſe Survivorſhips. By Mr. William Morgan. Communicated by the Rev. Richard Price, D.D. F.R.S. The hypotheſis of De Moivre with regard to the probability of the duration of human life is extremely ſimple, and tolerably accurate. He ſuppoſes that out of eighty-ſix perſons born at the ſame time, one dies annually till the whole number be extinguiſhed. The chance that a perſon, therefore, ſhall attain the age of n years is $\frac{86-n}{86}$, that of $n+1$, $\frac{85-n}{86}$, that of $n+2$, $\frac{84-n}{86}$, &c. Whence the chance that a

perſon

perſon of the age n ſhall ſurvive the preſent year is $\frac{85-n}{86-n}$; and the chance that he ſhall die within the year is $\frac{1}{86-n}$. By the help of theſe data the ſeveral problems in the doctrine of annuities can be ſolved with conſiderable elegance. But the hypotheſis is particularly erroneous with regard to the early and the very advanced periods of life; and in the caſe of joint-lives and of ſurvivorſhips, the errors are prodigiouſly increaſed. Recourſe muſt therefore be had to tables of real obſervations. Mr. Morgan, in the paper before us, has pointed out ſome miſtakes into which his predeceſſors have fallen, and has ſhewn the proper mode of inveſtigation.—Suppoſe that the ages of two perſons, A and B, were given to determine the probability of ſurvivorſhip. Let A denote the number of perſons living at the age of A the younger, and a', a'', a''', &c. the decrements of life at the end of the 1ſt, 2d, 3d, &c. years. Let b repreſent the number of perſons alive at the age of B, and c, d, e, &c. thoſe living at the end of the 1ſt, 2d, 3d, &c. years. The event that B ſhall ſurvive A during the firſt year may take place in two ways; either A may expire during that time, or both. The chance that A dies the firſt year is $\frac{a'}{a}$, and that B ſurvives that time is $\frac{c}{b}$; the chance, therefore, that both events take place is $\frac{a'c}{ab}$. The probability that both lives are extinguiſhed during the firſt year is $\frac{a'}{a} \times \frac{b-c}{b}$; but the priority of the deaths is indifferent; the half of this fraction, or $\frac{a'(b-c)}{2ab}$, will therefore expreſs the chance that A dies firſt. Hence the whole probability that B will ſurvive in the firſt year is $\frac{a'c}{ab} + \frac{a'(b-c)}{2ab}$, or $\frac{a'(b+c)}{2ab}$; and ſo on for the ſucceſſive years. Hence the whole probability of B's ſurviving A will be $= \frac{1}{ab}\left(\frac{b+c}{2}.\ a' + \frac{c+d}{2}.\ a'' + \frac{d+e}{2}.\ a'''\text{, \&c.}\right)$

Mr. Morgan has taken the trouble to calculate, from theſe principles and the Northampton Obſervations, ſome uſeful tables, which accompany this paper.

Art. XXI. An Account of a remarkable Tranſpoſition of the Viſcera. By Matthew Baillie, M. D. In a Letter to John Hunter,

Hunter, Eſq. F. R. S. It is curious to obſerve how Nature ſports in her productions. In her wild excurſions ſhe is perhaps more aſtoniſhing than in her uniform plans. In theſe unguarded moments, ſhe ſometimes lays aſide part of that myſtery with which ſhe is commonly enveloped; and hence the detection of her deviations often throws light upon her ordinary courſe. The ſubject of this paper is a monſter of a ſingular kind. The *luſus* was wholly internal, and eſcaped common obſervation. The perſon was a male near forty years of age, ſomewhat above the middle ſize, and of a clean active ſhape. Upon diſſection the parts were found reverſed. The right auricles and ventricles of the heart occupied the place of the left. The right lung was divided into two lobes, and the left into three; exactly contrary to what is found in ordinary caſes. A ſimilar tranſpoſition took place in the abdomen. The blood veſſels were very irregular in their poſitions and ramifications. The ſtructure of the brain and of the organs of ſenſe, offered nothing remarkable.

Art. XXII. On the Georgian Planet and its Satellites. By William Herſchell, LL. D. F. R. S. We may ſtate the general reſult of Dr. Herſchell's obſervations with regard to the ſatellites of the new planet. The diameter is 34,217 miles, and, ſeen from the earth, it ſubtends an angle of 4″. The bulk of the planet is eighty times that of the earth, and its denſity about $\frac{1}{5}$. The firſt ſatellite performs its revolution in 8 days 17 hours 1′ 19″, and its diſtance is 33″; the ſecond revolves in 13 days 11 hours and 5 minutes, and at the diſtance of 44″$\frac{1}{2}$. Its axis is above 80° inclined to the ecliptic.

Art. XXIII. Experiments on the Formation of Volatile Alkali, and on the Affinities of the Phlogiſticated and light Inflammable Airs. By William Auſtin, M. D. Fellow of the College of Phyſicians. Communicated by Charles Blagden, M. D. Sec. R. S. The reſolution of volatile alkali into the hydrogenous and azotic gas had occurred to ſeveral chemiſts, but it was firſt completely demonſtrated by the ingenious M. Berthollet. Several attempts have been made to recompoſe the alkali from theſe elaſtic fluids, but without ſucceſs. When hydrogen and azote aſſume the elaſtic form, they abſorb a large portion of caloric, which increaſes with their rarity; and they cannot be brought to combine, unleſs a ſubſtance be preſented which has a ſtronger attraction for the matter of heat. Dr. Auſtin tried to deprive them of their latent heat, and to form an union by the application of cold and the addition of other gaſes; but did not ſucceed. Hence theſe gaſes cannot be converted into volatile alkali, except at the inſtance of their extrication. If powdered tin be moiſtened with nitrous acid and fixed alkali, or quick-lime be

be added, the ſmell of volatile alkali is immediately perceived. In this caſe the oxygen from the water and the acid unite to the metal, while the hydrogen and azote form volatile alkali. The fixed alkali ſeems only to aſſiſt the decompoſition. Dr. Auſtin ſucceeded in a very beautiful experiment. He introduced azotic gas into a cylindrical glaſs tube inverted in quickſilver, and afterwards iron-filings, moiſtened with diſtilled water. The hydrogen detached from the water by the contact of the iron, united with the azotic gas, and formed volatile alkali. The experiment ſucceeds with atmoſpheric air, though it requires a longer time to be manifeſt. Hence when it ruſts in contact with water, it forms volatile alkali. The component gaſes are conſtantly produced in all parts of the earth; and hence the origin of volatile alkali in coal mines and in volcanos. It appears the quantity of azotic gas in alkaline air is about four times that of the hydrogen.

Art. XXIV. Some Properties of the Sum of the Diviſors of Numbers. By Edward Waring, M. D. F. R. S. This paper contains ſome curious analytical diſquiſitions. It is to be conſidered as an addition to a treatiſe publiſhed ſeveral years ago by the author, entitled *Meditationes Algebraicæ*. From its nature it does not admit of abridgment.

Art. XXV. Experiments on the Production of artificial Cold. By Mr. Richard Walker, Apothecary to the Radcliffe Infirmary at Oxford. In a Letter to Henry Cavendiſh, Eſq. F. R. S. and A. S. When a body is converted from a ſolid to a fluid ſtate, a quantity of its heat diſappears, or becomes *latent*. This beautiful diſcovery of the great Dr. Black is undoubtedly one of the moſt important in the ſcience of chemiſtry. It has extended our views of the nature of heat, and thrown light upon many natural phenomena. Hence cold is produced during the ſolution of any ſalt in water. The people of India employ ſaltpetre to cool their liquors. This is, in ſome degree, the effect of every ſaline ſolution; but the intenſity of the cold depends upon the capacity of the ſalt for heat, and its degree of ſolubility. After water is completely ſaturated with one ſpecies of ſalt, it can ſtill diſſolve conſiderable portions of other kinds. Hence in this way a greater quantity of ſolid matter may be converted into fluid, and conſequently a more intenſe degree of cold produced. The mixtures which Mr. Walker has diſcovered are moſt powerfully frigorific. Cryſtalliſed nitrated ammonia, reduced to very fine powder, ſunk the thermometer, during its ſolution in rain water, 49°. Equal parts of ſal ammoniac and nitre in powder, make a cheap and convenient compoſition for producing cold. It ſinks the thermometer 36°. Equal parts of nitrated ammonia and mineral alkali produce a cold even

of 57°. But one of the moſt powerful mixtures is two parts fuming nitrous acid and one part water, well mixed, and reduced to the temperature of the atmoſphere, 4 Glauber's ſalt, $3\frac{1}{2}$ nitrated ammoniac. This depreſſes the thermometer 52°.—Upon the whole, theſe experiments are not only curious, but may prove beneficial to mankind. By thoſe frigorific mixtures we may always produce ice in our climate, and even in the tropical regions; as the mean annual temperature ſeldom exceeds 80° we may generally be able to bring on congelation. The method propoſed by the evaporation of æther is more expenſive, and, requiring the aſſiſtance of the air-pump, it is very inconvenient.

Art. XXVI. A Deſcription of an Inſtrument which, by the turning of a Winch, produces the Two States of Electricity without Friction or Communication with the Earth. In a Letter from Mr. William Nicholſon to Sir Joſeph Banks, Bart. P. R. S. This appears to be an ingenious and elegant inſtrument; but it would be difficult to convey a diſtinct idea of it without the aſſiſtance of a figure. It is conſtructed upon the principle diſcovered by Volta, that the capacity of bodies for the electrical fluid is increaſed by their appoſition. It bears a conſiderable reſemblance to Bennet's doubler, and confirms the remark of Cavallo, that the electrical equilibrium which ſubſiſts among connected bodies is not quite perfect.

Art. XXVII. Abſtract of a Regiſter of the Barometer, Thermometer, and Rain, at Lyndon in Rutland; with the Rain in Hampſhire and Surrey, in 1787. Alſo ſome Account of the annual Growth of Trees. By Thomas Barker, Eſq. Communicated by Thomas White, Eſq. F. R. S. The greateſt height of the mercury in the barometer was 30,13 inches, the loweſt 28,15, and the medium 29,415. The medium temperature of the year 50°. It is curious to obſerve the great difference in the quantity of rain fallen near the ſame place. In the ſmall county of Rutland the fall at one place was 36 inches, in another only 22.—The growth of the oak and aſh is nearly the ſame, about an inch in girth annually. Hence large trees acquire greater additions to their bulk in the ſame time than ſmall ones.

Art. XXVIII. On the Era of the Mahometans, called the Hejerà. By William Marſden, Eſq. F. R. S. and A. S. The flight of Mahomet from Mecca to Medina was, eighteen years afterwards, diſtinguiſhed as the criſis of the new religion, and eſtabliſhed as an epoch to which the tranſactions of the faithful ſhould in future be referred. It commenced at ſunſet, from which the Arabs begin their day, on Thurſday the 15th July, A. D. 622. The Mahometan year conſiſts of twelve lunar months, without any intercalation; and therefore it anticipates the

the completion of the ſolar year, and revolves through all the ſeaſons. There are, however, two modes of reckoning; the vulgar and political. In the former the year commences from the firſt appearance of the new moon, on the evening of the firſt or ſecond day after the conjunction. This is announced by perſons placed on the pinnacles of the moſques, and other elevated places, to the people below, who welcome it with the ſound of inſtruments, firing of guns, and other demonſtrations of reſpect and zeal. The political mode of reckoning was regulated by a cycle of thirty years. The mean ſynodic revolution, according to the Arabs, was 29 days and $12\frac{793}{1080}$ hours; and conſequently the lunar year conſiſted of 354 days $8\frac{864}{1080}$ hours.—We cannot omit to obſerve the aſtoniſhing accuracy of the aſtronomical obſervations made in the Eaſt; the country whence we derived our arts, our ſcience, and our religion. The length of the Arabian lunar month differs only three ſeconds from the moſt accurate modern obſervations. The fraction $\frac{11}{30}$ of a day is exactly 8 hours and 48 minutes, or $8\frac{864}{1080}$ hours, the exceſs of the lunar year above 354 days. Hence the cycle conſiſted of 11 years of 355 days, and 19 of 354. The whole error amounted, in a period of thirty years, only to 18 minutes. How much ſuperior to the clumſy intercalations employed in Europe! The Mahometan months conſiſt alternately of 29 and 30 days; but in the years of exceſs an intercalary day is beſides added to the laſt month. The annual anticipation of Mahometan years, 10 days and 21 hours, or nearly 11 days. Hence their periods may be calculated. The preſent year of the Hejera, 1204, began on Monday, 21ſt September, 1789; the next, 1205, commences on Friday, 10th September, 1790, &c.

This elegant and ingenious paper cloſes with a table exhibiting the correſpondent years of the Hejera with thoſe of the Chriſtian era.

ART. VII. *Travels to diſcover the Source of the Nile, in the Years* 1768, 1769, 1770, 1771, 1772, *and* 1773. *In Five Volumes. By James Bruce, of Kinnaird, Eſq. F. R. S.* 4to. 5l. 5s. boards. Edinburgh, printed: G. G. J. and J. Robinſon, London. 1790.

AT laſt, after the lapſe of full ſixteen years, when the long delay had nearly changed hope into deſpair, the deſire of the learned and inquiſitive of every nation is gratified; and the general burſt of impatient curioſity will welcome theſe volumes by exclamations like thoſe with which Æneas receives the ghoſt of Hector:

Quæ tantæ tenuêre moræ? quibus--ab oris,
Exſpectate, venis?

We, for our parts, make haſte to gratify our readers with a full and diſtinct account of a work expected ſo long, and ſo ardently deſired; for in theſe days of rapid communication and widely diffuſed information, we may fairly preſume that there is no individual, in any degree attentive to literature and ſcience, to whom the name of ABYSSINIAN BRUCE is either unknown or indifferent. To moſt of thoſe alſo whom the vague deſire of ſeeing curious things, or the tenor of their particular ſtudies has led to the Britiſh botanic gardens, it muſt have happened to ſee ſome ſpecimens of thoſe vegetable treaſures which the adventurous traveller gathered on his long and perilous expedition. Among theſe, that which ſaved the life, and bears the name of its diſcoverer, the Brucea Antidyſenterica, is, if we miſtake not, the moſt common. From the new plants, therefore, received as ſuch by the univerſal conſent of botaniſts, there ariſes a ſufficient proof that the importer muſt have viſited regions unknown and unexplored.

As in ſitting down to a book of this nature every reader feels diſſatisfied and uncomfortable till his notions are in ſome meaſure ſettled as to the degree of credit to which the narrative is entitled, we begin by oppoſing the abovementioned ſtrong preſumption to the tale of calumny, that has put on an hundred forms, and been whiſpered into the ears of tens of thouſands. To this tale we conjecture, and not merely to Baron Tott, that numerous and ſtrong proteſtations of veracity, diſperſed through the different volumes, allude; and we ſuppoſe of courſe the author to be no ſtranger to it, though it is no where formally refuted, or even diſtinctly noticed. And why ſhould one, who has never been regularly accuſed, enter upon a ſuperfluous defence? There is, beſides, no want of other external evidence, ſuch as muſt immediately diſpel whatever miſt of doubt, the circulation of an anecdote improbable and ſcandalous, might ſpread over Mr. Bruce's pages. In truth, the anecdote, as we have often heard it related, is, if properly conſidered, foreign to the queſtion concerning the authenticity of the travels; if true in the moſt unfavourable ſtatement, it would only ſhew, what is ſo commonly ſeen, how a man in converſation with a perſonage placed in a very elevated ſtation may be diſconcerted, or a ſudden ſwell of vanity hurry him into an imprudent aſſertion, and render him not ſo much criminal as ridiculous.

In the examination of this work many readers will go along with us with minds more at eaſe if we produce, of that other external evidence, ſo much as leads us irreſiſtably to believe that

that the author muſt really have viſited diſtant regions, and that thoſe regions are Abyſſinia itſelf, where the head of every Frank is devoted the moment he croſſes the fatal boundary, and 'from 'whoſe bourne,' according to another uſage, 'no traveller re-'turns,' without great difficulty, even of thoſe who are permitted to enter the country. It was therefore doubly improbable that any European ſhould bring back an account of the ſpot where the Nile has for ages concealed his long-ſought head. M. de Buffon, in the advertiſement prefixed to the third volume of his Natural Hiſtory of Birds, acknowledges, in ſtrong terms, the advantage he had derived from our traveller's communications. 'I have,' ſays he, 'to mention ſome aſſiſtance I have 'very lately received; it is the open and generous communica-'tion of Mr. Bruce's obſervations and information. In ſurvey-'ing the immenſe collection of *drawings which he himſelf had* '*taken and coloured*, I was ſtruck with aſtoniſhment; he has 'made perfect repreſentations of animals, birds, fiſhes, plants, 'buildings, arms, dreſs, &c. of the different nations; no object 'has eſcaped his curioſity, and every thing has been graſped by 'his talents.' This illuſtrious teſtimony, however it may have contributed ſtill more to raiſe curioſity, already at an high pitch, ſeems not ſo much to our purpoſe as ſome other information of a later date.

The Baron de Tott having inſinuated that Mr. Bruce was never at the ſources of the Nile, becauſe Mr. Bruce's ſervant (who was with him in Abyſſinia) ſaid at Cairo that he never accompanied his maſter to any ſuch ſpot, a warm defence, attributed to Mr. D. Barrington, appeared in the Review of the late Mr. Maty for March 1786. The material part of this defence is a letter from Mr. Antes at Cairo, which ſtates 'that 'Mr. Bruce left Cairo in 1768, and proceeded thence into 'Abyſſinia, by way of Jedda, Maſuah, and Arquico; that in '1771 a Greek came from Gondar with a draft from Mr. Bruce 'on a French merchant at Cairo, for ſeveral hundred German 'crowns, and a letter; that Mr. Antes was preſent at a con-'verſation between Mr. Bruce and two Armenians from Abyſ-'ſinia, who ſeemed glad to ſee him again; that the Franciſcan 'friars at Aſſouan, the higheſt town in Upper Egypt, are 'ready to atteſt his return by Nubia and Upper Egypt; that 'Mr. Antes often converſed with Michael, Mr. Bruce's Greek 'ſervant, who is ſtated to have by no means had a lively ima-'gination, and who always agreed with the circumſtances men-'tioned by his maſter, and more particularly in relation to their 'having viſited the ſources of the Nile, which the Baron Tott 'doubts of, from having had a converſation with this ſame 'Greek ſervant; that Baron Tott ſtayed but a few days at 'Cairo;

'Cairo; and, from his ſhort reſidence in that country, has 'given ſeveral erroneous accounts relative to Egypt; that Mr. 'Antes converſed with others who had known Mr. Bruce in 'Abyſſinia.' Upon the force and tendency of this evidence, which we have given nearly in the words of Mr. Antes, no commentary is neceſſary. It muſt needs be admitted, unleſs we wantonly ſuppoſe a combination to propagate falſehood where there could be no inducement on the part of Mr. Antes.

But nothing rendered us ſo eagerly deſirous of the preſent publication, or prediſpoſed us ſo much in its favour, as ſome information lately communicated by a perſon inceſſantly watchful to promote the intereſts of every kind of learning. This information may be found in a converſation between Sir William Jones and Abram, an Abyſſinian, as it is inſerted in the *Aſiatic Reſearches*, Vol. I. p. 383. Sir William having made ſeveral inquiries, is thus anſwered by Abram: 'All theſe matters are, I ſuppoſe, explained in the 'writings of YAKUB, whom I ſaw thirteen years ago at 'Gwender; he was a phyſician, and had attended the king's 'brother, who was alſo a vazir, in his laſt illneſs. The prince 'died; yet the king loved YAKUB; and indeed all the court and 'people loved him. The king received him in his palace as a 'gueſt, ſupplied him with every thing he could want, and when 'he went to ſee the ſources of the Nile and other curioſities, 'for he was extremely curious, he received every poſſible 'aſſiſtance and accommodation from the royal favour; he 'underſtood the languages, and wrote and collected many 'books, which he carried' *away* 'with him.' It was impoſſible, adds the celebrated orientaliſt, for me to doubt, eſpecially when he deſcribed the perſon of YAKUB, that he meant James Bruce, Eſq. who travelled in the dreſs of a Syrian phyſician, and probably aſſumed with judgment a name well known in Abyſſinia, &c. Yagoubé is the way Mr. Bruce ſpells the name; not aſſumed, as the preſident of the Aſiatic Society imagines, but his own name of baptiſm, James, Jacobus, Yakub, Yagoubé. Sir William Jones adds that he has ſeen our traveller mentioned with great regard in a letter from an Arabian merchant at Mokha, and rightly conjectures that he entered Abyſſinia by the way of Muſuwwa, or, according to Mr. Bruce's orthography, Maſuah.

Having thus ſettled with the reader ſo much of our preliminaries as relates to the general authenticity of Mr. Bruce's narrative, our eſtimate of the credibility of particulars muſt be given as we find them occurring in different parts of his extenſive journal: and let it not be ſuppoſed that in this previous declaration of ſuſpiciouſneſs and ſcrupuloſity, there is any thing diſparaging to the relater. We have to peruſe the deſcription

of a country extremely diſſimilar to our own, and having many peculiarities of climate, ſoil, and ſurface; of a people cut off from mankind, and therefore offering many temptations to him who delineates them to employ too bold ſtrokes, and colours too glaring. We are taught by examples, far too frequent, how common it is to give to the public erroneous accounts of adjacent countries, notwithſtanding a wrong repreſentation muſt endanger the author's reputation, either for good faith or judgment, where it is ſo eaſy to compare the copy with the original, or with other copies. But, in a diſtant and inacceſſible country, how eaſily may fatigue or liſtleſſneſs perſuade the artiſt to content himſelf with a rough and imperfect ſketch, when he is not likely to be reproached for his careleſſneſs. Then behold another powerful cauſe of miſrepreſentation: for who can bear his mind ſo even and compoſed that ſtrange and unexpected appearances and cuſtoms ſhall raiſe neither admiration nor diſguſt? Who can reſtrain his buſy imagination from altering, in any ſhape, the pure and natural picture formed upon his eye? This praiſe, of all modern travellers, belongs almoſt excluſively to Niebuhr. That cold and ſedate geographer ſucceeded perfectly in ſubduing this intruſive faculty; he alone could always keep his eye open, and his attention alive. Reſolute and courageous, prudent and full of addreſs as he was, he is never the hero of his own tale; his conduct ſeems always to ariſe from circumſtances, and every reader thinks he could have done as well; he never ſurveys himſelf but as another man would ſurvey him. Thus modeſt and diſpaſſionate, he impoſed not on himſelf, nor ſuffered others to impoſe upon him. Always zealous to diſcharge his commiſſion faithfully, and bearing up againſt fatigue, he brought back a more valuable ſtock of information than could reaſonably have been expected from the whole ſociety of which he was the only ſurvivor. He ſcarce enters a town without giving a plan of it, ſees an inſcription without copying it, and how much his maps have added to geographical knowledge need not now be told. Mr. Bruce and this accurate and veracious traveller ſometimes traverſe the ſame ground; and there cannot be a more agreeable taſk than to compare them. Of books relating to Abyſſinia itſelf, at leaſt of ſuch as contain any information that can gratify rational curioſity, the penury is well known. We have ſeveral written by the Jeſuits; but the philoſophy of mankind was a ſcience as yet unknown; and at no time likely to be foſtered by the care of a Jeſuit. Intent upon extending the influence of their order, and blinded by bigotry and ſuperſtition, their writings contain little but an account of their good or ill ſucceſs in impoſing the wretched and contemptible dogmas of their ſcholaſtic theology upon ignorant ſavages, or making them repeat

ſounds

ſounds which *paſs all underſtanding*. The voyage of Jerome Lobo is juſtly degraded by Mr. Bruce to a rank much below that which it has held in this country; he ſcruples not to call him 'the greateſt liar among the Jeſuits.' Towards the end of the laſt century Leutholf, or Ludolph, had, by inceſſant labour and admirable ſagacity, extracted from the motley maſs of materials ſupplied by the ignorance and ſuperſtition of the miſſionaries, together with the aſſiſtance of a native Abyſſinian, of whom the reader will find a portrait, and a curious and entertaining account in Ludolf's ſecond volume, and ſome other helps, every thing that is worth the notice of a philoſophical inquirer. This work of grammar, hiſtory natural and civil, and geography, was without a rival at the time of its publication, and is mentioned by Mr. Bruce with due reſpect.

To many readers, both of Mr. Bruce's Travels and our abſtract, a few words on the nature and importance of ſuch intelligence as may be expected from thoſe travels, may afford ſome aſſiſtance in eſtimating their value. The ſcene of the narrative is laid principally in Africa, on the eaſtern confines of that quarter of the globe. Now there are few who are not appriſed of the ſcantineſs of our information concerning the interior parts, and indeed the whole of this broad tract of dry land, except the weſtern and northern margin, and the ſouthern point. And when the moderns plume themſelves upon that ſuperior knowledge of man and nature which they owe to the civiliſation of Germany, and the ancient Scandinavia, or countries north of the Baltic, the diſcovery of America, the ſeveral expeditions ſent from Peterſburgh to explore the vaſt regions ſubject to the Empreſs of Ruſſia, the Daniſh miſſion, and the late Britiſh navigators; they ſeem not ſufficiently to recollect how much the ignorance of all theſe regions was compenſated to the ancients by their more intimate acquaintance with Africa. We may venture to advance that, among the remains only of the monuments of ancient ſcience, more information is to be found than in all the numerous productions of modern preſſes concerning the country of which we are ſpeaking; and of this, much that occurs in Diodorus Siculus, and nearly every thing in Strabo, may be received as equally credible and authentic with the beſt modern narratives. If Great-Britain and Denmark now ſend out armaments and bodies of learned men to explore the other hemiſphere, the North Pacific Ocean, and both the deſert and cultivated provinces of Arabia, Egypt was not always cruſhed under the iron rod of her preſent rulers, or rather diſtracted and helpleſs under her preſent anarchy. When the face of Britain and Denmark preſented only thickets and bogs, Egypt was vigorous and enterpriſing, eſpecially under the Ptolomies. The Greeks

at

at leaſt were active and adventurous; and why ſhould we ſuppoſe the other inhabitants to have loſt all that ſpirit and art which cultivated their fields, dug their canals, and reared their monuments at a time when the ſavage and unſettled Greeks diſputed with the beaſts the poſſeſſion of their dens? Diſcoveries made in the part of Africa viſited by Mr. Bruce, by the Cooks and Niehbuhrs of other ages, were faithfully recorded by Artemidorus and Agatharcides, and copied by the other Greek writers already mentioned; by Diodorus more ſervilely, and with a mixture of monſtrous and abſurd fables from impurer ſources; by Strabo, after a careful compariſon and ſevere ſcrutiny. Every reader, therefore, will readily join the philoſophical and learned profeſſor of Gottingen in wiſhing, 1. That the ancient and modern accounts of Africa were thoroughly examined, and judiciouſly compared together, and that a full and diſtinct extract was made from the whole; 2. That the ſtates of Europe would follow the example of Denmark in attempting to penetrate Africa from various quarters, as well from the eaſt as the weſt.

Of the latter deſideratum a private aſſociation in this country is endeavouring to fulfil part; the travels before us are calculated to fulfil another part; ſo that we may hope yet, before the end of the century, to ſee this great blank in our maps of the globe filled with the traces of rivers and the ſhadows of mountains; ſome of it perhaps with the names of populous cities, and nations no longer barbarous.

In the title-page of the preſent work we have the engraving of a medal, repreſenting on one ſide the diſcoverer, on the other the detected head of the divinity of the Nile, from which Apollo lifts the veil, and looks towards the traveller; the reading is,

—— Nec contigit ulli
Hoc vidiſſe caput. ——

Mr. Bruce, perhaps, rather too often breaks out, like another wandering hero,

Sum pius Æneas famâ ſuper æthera notus.

It is always more prudent in an author to leave others to compliment him upon his achievements than to compliment himſelf. Admiration is a kind of commentary which every reader can ſupply at pleaſure. We are glad to ſee that the work is dedicated to the king. But why did the author encumber himſelf with the difficulty of ſo long a dedication? In this we fear he has failed with moſt of his brother dedicators; his meaning may generally be conjectured in ſpite of the unhappy labour of his ill-

conſtructed

conſtructed ſentences: but we would not undertake always to reconcile the ſenſe which he ſeems to mean to expreſs, with his expreſſions; for inſtance: 'It [your majeſty's reign] was a 'golden age, which united humanity and ſcience, exempted 'men of liberal minds and education, employed in the *nobleſt of* 'all occupations, that of exploring the diſtant parts of the globe, 'from being any longer degraded, and rated as little better than 'the buccaneer or the pirate, becauſe'—*mark the reaſon*—'be-'cauſe they had, till then, in manners been nearly ſimilar.' We do not underſtand how thoſe, whoſe manners are nearly ſimilar to the buccaneer and pirate, are degraded by being ranked as buccaneers and pirates. How are buccaneers and pirates known but by their manners? How can he who has ſuch manners be ſaid to have a liberal mind? But we have no inclination to carp; let the dedication paſs: where, if not in a dedication, may nonſenſe hope to find an aſylum?

The introduction diſplays the difficulty of the author's attempt; 'even conquerors at the head of immenſe armies, who 'had firſt diſcovered and then ſubdued great part of the world, 'were forced to lower their tone here, and dared ſcarcely to 'extend their advances towards this diſcovery beyond the limits 'of bare wiſhes.' We well know how neceſſary enthuſiaſm is to the achievement of any great undertaking; but in the expreſſions of Mr. Bruce's enthuſiaſm there is ſomething rather too ludicrous; as in thoſe paſſages where he talks of 'parties 'formed againſt his work,' of the influence of cabals, and the 'virulent ſtrokes of malice, envy, and ignorance, of perſons 'more wicked than weak,' who affected to diſbelieve that he he had ever performed theſe travels, there is more foreneſs than a man confident of a good cauſe need feel or ſhew. Page 3 he ſays, 'if I had ſtill any motive to defer ſubmitting theſe obſer-'vations to their judgment, it could only be that I might em-'ploy that interval in poliſhing and making them more worthy 'of their peruſal;' yet, p. 64-65, he tells us of other motives, ſickneſs, law-ſuits, and a ſtill heavier private affliction that occupied his attention, and probably at times left him little power or inclination to poliſh and arrange his materials: indeed, he has ſomething p. 65 which ſeems ſcarce conſiſtent with the long labour before mentioned: 'No great time has paſſed ſince the 'work was in hand. The materials collected upon the ſpot 'were very full, and ſeldom deferred to be ſet down beyond the 'day wherein the events deſcribed happened; but oftener, when 'ſpeeches and arguments were to be mentioned, they were noted 'the inſtant afterwards; for, contrary to what I believe is often 'the caſe, I can aſſure the reader theſe ſpeeches and converſations 'are abſolutely real, and not the fabrication of after-hours.' We do

do not ſee the great neceſſity for all this labour in poliſhing the journal, even including the hiſtory of Abyſſinia. Niebuhr, whoſe travels and deſcription of Arabia, as to the labour of publication, &c. exceed theſe volumes of Mr. Bruce beyond all eſtimation, on account of the number of plates and multitude of oriental words, interſperſed through his text, took a time much ſhort of ſixteen years, though in the meanwhile he publiſhed the Obſervations of Forſkal.

Mr. Bruce was firſt animated to this arduous undertaking by the inſpiring voice of the late Lord Chatham. After tedious negociations with miniſters, he was perſuaded by Lord Halifax to accept the conſulſhip at Algiers, where he embraced the opportunities offered to him of learning Arabic and Greek, ſo as to ſpeak it, together with medicine and ſurgery. He gives us a ſuccinct narrative of ſeveral excurſions into the country of this part of Africa, frequently animadverting upon Dr. Shaw, in whoſe footſteps he often treads; being oftener, however, carried by that ſpirit of adventure, for which he ſeems diſtinguiſhed above travellers, beyond the track of Shaw. And ſuch was our traveller's diligence in theſe expeditions that he believes there is not a fragment of good taſte in architecture in this part of Africa of which he has not brought drawings to Britain. Unfortunately every one of theſe is withheld from the public; for moſt, we are referred to the king's collection; a few remain with himſelf. He might ſurely have given us one ſample at leaſt of his talents for drawing, and judgment in ancient architecture, and not have left us with this impreſſion after reading his introduction; to wiſh moſt heartily to exchange nearly every thing that he has communicated for a particle of what he has kept to himſelf. The idea of a camera obſcura, in which, as in a ſummer-houſe, the draughtſman might ſit unſeen and perform his drawing, has great merit, and the remarks, p. 9, 10, on its advantages, ſeem judicious. The anecdote concerning the tribe of lion-eaters, and the ſtrictures on the univerſity of Oxford, ſtand forward and claim notice. There is ſomething whimſical in the exactneſs with which the age and ſex of the lions, on which our traveller feaſted, are reported. Should the reader ſmile at the paſſage, his ſmile, if he ſympathiſes with us, will not be a tribute to the author's powers of raillery. Let him, however, make the experiment:

'Before Dr. Shaw's travels firſt acquired the celebrity they have maintained ever ſince, there was a circumſtance that very nearly ruined their credit. He had ventured to ſay in converſation that theſe Wellid Sidi Boogannim were eaters of lions; and this was conſidered at Oxford, the univerſity where he had ſtudied, as a traveller's licence on the part of the doctor. They took it as a ſubverſion of the

the natural order of things that a man ſhould eat a lion, when it had long paſſed as almoſt the peculiar province of the lion to eat man. The doctor flinched under the ſagacity and ſeverity of this criticiſm; he could not deny that the Welled Sidi Boogannim did eat lions, as he had repeatedly ſaid; but he had not yet publiſhed his travels, and therefore left it out of his narrative, and only hinted at it after in his appendix.

'With all ſubmiſſion to that learned univerſity, I will not diſpute the lion's title to eating men; but, ſince it is not founded upon patent, no conſideration will make me ſtifle the merit of Welled Sidi Boogannim, who have turned the chace upon the enemy. It is an hiſtorical fact; and I will not ſuffer the public to be miſled by a miſrepreſentation of it; on the contrary, I do aver, in the face of theſe fantaſtic prejudices, that I have ate the fleſh of lions; that is, part of three lions, in the tents of Welled Sidi Boogannim. The firſt was a he lion, lean, tough, ſmelling violently of muſk, and had the taſte which, I imagine, old horſe-fleſh would have. The ſecond was a lioneſs, which they ſaid had that year been barren. She had a conſiderable quantity of fat within her; and, had it not been for the muſky ſmell that the fleſh had, though in a leſſer degree than the former, and for our fooliſh prejudices againſt it, the meat, when broiled, would not have been very bad. The third was a lion's whelp, ſix or ſeven months old; it taſted, upon the whole, the worſt of the three. I confeſs I have no deſire of being again ſerved with ſuch a morſel; but the Arabs, a brutiſh and ignorant folk, will, I fear, notwithſtanding the diſbelief of the univerſity of Oxford, continue to eat lions as long as they exiſt.'

At Jibbel Aurez he meets with a tribe, who, if not fair like the Engliſh, 'were of a ſhade lighter than that of the inhabitants of any country to the ſouthward of Britain; their hair was red, and their eyes blue.' Whether the very ingenious conjecture that they may be the remnant of an army of Vandals, whom Procopius mentions as having been defeated here, be right or not, the fact is important, and corroborates other proofs of this negative propoſition in the natural hiſtory of the human race, *that colour is not owing to climate.*

All intelligence relating to the interior parts of Africa being valuable, we muſt not omit the circumſtance of his meeting with a caravan of pilgrims from Fez and Sus in Morocco, traverſing Africa in their way to Mecca, almoſt from corner to corner, viz. from the Weſtern Ocean to the weſtern banks of the Red Sea or the kingdom of Sennaar. It conſiſted of about 3000 men, and from 12,000 to 14,000 camels, part loaded with merchandiſe, part with ſkins of water, flour, and other kinds of food, for the maintenance of the Hadjees or pilgrims. 'They were a ſcurvy, diſorderly, unarmed pack; and when my horſemen, though but fifteen in number, came up with them, in the grey of the morning, they ſhewed great

ſigns

'ſigns of trepidation, and were already flying in confuſion. 'When informed who they were, their fears ceaſed, and, after 'the uſual manner of cowards, they became extremely inſo-'lent.' The poor pilgrims, however, in traverſing thoſe dreary deſerts, had cauſe enough of alarm, for they were afterwards plundered by the Welled Ali, a powerful tribe of Arabs that occupy the whole country between Ptolometa and Alexandria; and moſt of them periſhed for want of water.

At Ptolometa our traveller embarks on board a ſmall Greek junk, belonging to a little iſland near Crete. Contrary winds drove him back to the weſtward, and he was ſhipwrecked near Bongazi, where he loſt 'a ſextant, a parallactic inſtrument, a 'time-piece, a reflecting teleſcope, an achromatic one, a copy 'of M. de la Baillie's Ephemerides for 1775, much to be re-'gretted, as being full of marginal notes; a ſmall camera ob-'ſcura, ſome guns, piſtols, a blunderbuſs, and ſeveral other 'articles.'

From this diſaſtrous ſituation the author gets, after touching at ſome intermediate places, to Sidon, and makes excurſions in Syria as far as Palmyra. But from a general rule, not to interfere with the labours of others, and from a particular reſpect to Mr. Wood, he forbears to publiſh any thing of this intereſting place, though he took ſix views, which, with views of Baalbec, 'are now in the king's collection.' At Sidon he receives news that his loſſes are ſoon to be repaired by two teleſcopes, one reflector by Short, and one achromatic by Dollond. By the repreſentations of Buffon and Guys, Louis XV. was moved to ſend him a quadrant to Alexandria, where he found it and the other inſtruments.

After this prelude to a more ſerious expedition, Mr. Bruce mentions what we have already quoted of circumſtances that have retarded this publication, lays down the diſtribution of his work, and then concludes by a paſſage conſpicuous for its good ſenſe, and very material to ſatisfy the reader concerning ſome doubts that might ariſe in his mind, as well as to acquaint him with that ſyſtem of conduct which the author propoſed to follow in Abyſſinia. For this reaſon, and to counterbalance whatever diſapprobation a moſt impartial and attentive conſideration has hitherto obliged us to expreſs, we ſhall quote it, though it be of conſiderable length:

'In overlooking the work I have found one circumſtance, and I think no more, which is not ſufficiently clear, and may create a momentary doubt in the reader's mind, although to thoſe who have been ſufficiently attentive to the narrative, I can ſcarce think it will do this. The difficulty is, how did you procure funds to ſupport yourſelf and ten men ſo long, and ſo eaſily, as to enable you to

undervalue the uſeful character of a phyſician, and ſeek neither to draw money nor protection from it? And how came it that, contrary to the uſage of other travellers, at Gondar you maintained a character of independence and equality, eſpecially at court; inſtead of crouching, living out of ſight as much as poſſible, in continual fear of prieſts, under the patronage, or rather as ſervant to ſome men of power.

'To this ſenſible and well-founded doubt I anſwer with great pleaſure and readineſs, as I would do to all others of the ſame kind, if I could poſſibly divine them. It is not at all extraordinary that a ſtranger like me, and a parcel of vagabonds like thoſe that were with me, ſhould get themſelves maintained, and find at Gondar a precarious livelihood for a limited time. A mind ever ſo little poliſhed and inſtructed has infinite ſuperiority over barbarians; and it is in circumſtances like theſe that a man ſees the great advantages of education. All the Greeks in Gondar were originally criminals and vagabonds; they neither had, nor pretended to any profeſſion, except Petros the king's chamberlain, who had been a ſhoemaker at Rhodes, which profeſſion at his arrival he carefully concealed. Yet theſe were not only maintained, but by degrees, and without pretending to be phyſicians, obtained property, commands, and places.

'Hoſpitality is the virtue of barbarians, who are hoſpitable in the ratio that they are barbarous; and, for obvious reaſons, this virtue ſubſides among poliſhed nations in the ſame proportion. If, on my arrival in Abyſſinia, I aſſumed a ſpirit of independence, it was from policy and reflection. I had often thought that the misfortunes which had befallen other travellers in Abyſſinia aroſe from the baſe eſtimation the people in general entertained of their rank, and the value of their perſons. From this idea I reſolved to adopt a contrary behaviour. I was going to a court where there was a *king of kings*, whoſe throne was ſurrounded by a number of high-minded, proud, hereditary, punctilious nobility. It was impoſſible, therefore, too much lowlineſs and humility could pleaſe there.

'Mr. Murray, the ambaſſador at Conſtantinople, in the firman obtained from the Grand Signior, had qualified me with the diſtinction of Bey-Adzé, which means, not an Engliſh nobleman (a peer), but a noble Engliſhman; and he had added likewiſe, that I was a ſervant of the King of Great-Britain. All the letters of recommendation, very many and powerful, from Cairo and Jidda, had conſtantly echoed this to every part to which they were addreſſed. They announced that I was not a man, ſuch as ordinarily came to them, to live upon their charity, but had ample means of my own; and each profeſſed himſelf guarantee of that fact, and that they themſelves, on all occaſions, were ready to provide for me, by anſwering my demands.

'The only requeſt of theſe letters was ſafety and protection to my perſon. It was mentioned that I was a phyſician, to introduce a conciliatory circumſtance, that I was above practiſing for gain. That all I did was from the fear of God, from charity, and the love of mankind. I was a phyſician in the city, a ſoldier in the field, a courtier every where, demeaning myſelf, as conſcious that I was not unworthy

of

of being a companion to the firſt of their nobility, and the king's ſtranger and gueſt; which is there a character, as it was with eaſtern nations of old, to which a certain ſort of conſideration is due. It was in vain to compare myſelf with them in any kind of learning, as they have none; muſic they have as little; in eating and drinking they were indeed infinitely my ſuperiors; but in one accompliſhment that came naturally into compariſon, which was horſemanſhip, I ſtudiouſly eſtabliſhed my ſuperiority.

'My long reſidence among the Arabs had given me more than ordinary facility in managing the horſe; I had brought my own ſaddle and bridle with me, and, as the reader will find, bought my horſe of the Baharnagaſh in the firſt days of my journey; ſuch a one as was neceſſary to carry me; and him I trained carefully, and ſtudied from the beginning. The Abyſſinians, as the reader will hereafter ſee, are the worſt horſemen in the world. Their horſes are bad, not equal to our Welſh or our Scotch galloways. Their furniture is worſe. They know not the uſe of fire-arms on horſeback; they had never ſeen a double-barrelled gun, nor did they know that its effect was limited to two diſcharges, but that it might have been fired on to infinity. All this gave me an evident ſuperiority.

'To this I may add, that, being in the prime of life, of no ungracious figure, having an accidental knack, which is not a trifle, of putting on the dreſs, and ſpeaking the language eaſily and gracefully, I cultivated with the utmoſt aſſiduity the friendſhip of the fair ſex, by the moſt modeſt, reſpectful diſtant attendance and obſequiouſneſs in public, abating juſt as much of that in private as ſuited their humour and inclinations. I ſoon acquired a great ſupport from theſe at court; jealouſy is not a paſſion of the Abyſſinians, who are in the contrary extreme, even to indifference.

'Beſides the money I had with me, I had a credit of 400*l.* upon Youſef Cabil, governor of Jidda. I had another upon a Turkiſh merchant there. I had ſtrong and general recommendations, if I ſhould want ſupplies, upon Metical Aga, firſt miniſter to the ſherriffe of Mecca. This, well managed, was enough; but when I met my countrymen, the captains of the Engliſh ſhips from India, they added additional ſtrength to my finances; they would have poured gold upon me to facilitate a journey they ſo much deſired upon ſeveral accounts. Captain Thornhill of the Bengal Merchant, and Captain Thomas Price of the Lion, took the conduct of my money affairs under their direction. Their Saraf, or broker, had in his hands all the commerce that produced the revenues of Abyſſinia, together with great part of the correſpondence of the Eaſt; and, by a lucky accident for me, Captain Price ſtaid all winter with the Lion at Jidda; nay, ſo kind and anxious was he as to ſend over a ſervant from Jidda on purpoſe, upon a report having been raiſed that I was ſlain by the uſurper Socinios, though it was only one of my ſervants, and the ſervant of Metical Aga, who were murdered by that monſter, as is ſaid, with his own hand. Twice he ſent over ſilver to me when I had plenty of gold, and wanted that metal only to apply it in furniture and workmanſhip. I do not pretend to ſay but ſometimes theſe ſupplies failed me, often by my negligence in not applying

in proper time, ſometimes by the abſence of merchants, who were all Mahometans, conſtantly engaged in buſineſs and in journies, and more eſpecially on the king's retiring to Tigré, after the battle of Limjour, when I was abandoned during the uſurpation of the unworthy Socinios. It was then I had recourſe to Petros and the Greeks; but more for their convenience than my own, and very ſeldom from neceſſity. This opulence enabled me to treat upon equal footing, to do favours as well as to receive them.

'Every mountebank-trick was a great accompliſhment there; ſuch as making ſquibs, crackers, and rockets. There was no ſtation in the country to which, by theſe accompliſhments, I might not have pretended, had I been mad enough to have ever directed my thoughts that way; and I am certain that in vain I might have ſolicited leave to return, had not a melancholy deſpondency, the *amor patriæ*, ſeized me, and my health ſo far declined as apparently to threaten death; but I was not even then permitted to leave Abyſſinia till under a very ſolemn oath I promiſed to return.

'This manner of conducting myſelf had likewiſe its diſadvantages. The reader will ſee the times, without their being pointed out to him, in the courſe of the narrative. It had very near occaſioned me to be murdered at Maſuah; but it was the means of preſerving me at Gondar, by putting me above being inſulted or queſtioned by prieſts, the fatal rock upon which all other European travellers had ſplit: it would have occaſioned my death at Sennaar, had I not been ſo prudent as to diſguiſe and lay aſide the independent carriage in time. Why ſhould I not now ſpeak as I really think; or why be guilty of ingratitude which my heart diſclaims? I eſcaped by the providence and protection of heaven; and ſo little ſtore do I ſet upon the advantage of my own experience, that I am ſatisfied, were I to attempt the ſame journey again, it would not avail me a ſtraw, or hinder me from periſhing miſerably, as others have done, though perhaps a different way.'

By the foregoing obſervations we flatter ourſelves that we have not only ſatisfied the reader as to the general authenticity of the narrative, but prepared him, in other reſpects, either to follow our abridgment, or the author's more ample detail, with advantage. Of a work ſo ſingular in its principal ſubject, and which we fear will continue ſo for a long period, the public curioſity will require at our hands information more than uſually full. In the next number we ſhall proceed to indulge this curioſity. Meanwhile we hope it will appear, as much from the nature of our abſtract as from our proteſtations, that we do not rank among the private friends or enemies of this author; and certainly have no ſhare in thoſe plots of defamation to which he alludes. The only queſtion with us is, how far he has illuſtrated geography and natural ſcience, and added to our knowledge of mankind. A book of travels may indeed entertain when it relates more to the perſon of the traveller than the countries

countries and people he viſits; but this is a very inferior merit, and we ſhould be ſorry if we ſhould be obliged to reſt here the chief claim of theſe volumes to public approbation.

[*To be continued.*]

ART. VIII. *A Treatiſe on Gun-powder; a Treatiſe on Fire-arms; and a Treatiſe on the Service of Artillery in Time of War. Tranſlated from the Italian of Aleſſandro Vittorio Papacino D'Antoni, Major-General in the Sardinian Army, and Chief Director of the Royal Military Academies of Artillery and Fortification at Turin. By Captain Thomſon, of the Royal Regiment of Artillery.* 8vo. boards. 8s. Egerton. London, 1789.

TO the glory of England, while ſhe has cultivated the arts of peace, almoſt beyond the example of any nation, ſhe has likewiſe given to the world ſome of the moſt valuable productions on the deſtructive, indeed, but important and neceſſary ſcience of war. It was the ſublime and penetrating genius of Newton that explored the laws which govern the ſyſtem of nature; and the celebrated Robins, actuated with the ſame ſpirit of philoſophical inquiry, firſt eſtabliſhed the theory of projectiles on any certain foundation; in which he has been followed with great abilities by Dr. Hutton, the preſent profeſſor of the royal academy at Woolwich. Amongſt the foreigners who have cultivated this art, the moſt conſpicuous is M. D'Antoni, the author of the treatiſe now before us. The works of this eminent Italian conſiſt of thirteen volumes in octavo, of which we ſhall give a ſhort account. The firſt of his productions was on the examination of powder. The author, conſidering fire as the baſis of all experiments upon gunpowder, ſets out with giving a definition of that element; and, after inveſtigating its effects on bodies, and pointing out the ſeveral modifications to which it is liable, he proceeds to an analyſis of ſulphur, charcoal, and ſaltpetre; the properties of which he conſiders, both individually and collectively, as in the manufacture of gun-powder, of which he deſcribes the various ſorts. He next deduces a theory of the inflammation of powder, with a number of practical inferences, which, in general, coincide with the reſults of experiments made in this country. In the ſecond part, after expatiating upon the difficulty of meaſuring the force of ignited gun-powder, and thence inferring the impoſſibility of determining it with preciſion in military operations, he inveſtigates the initial velocity of projectiles, with the law of their impulſion, and concludes his inquiry with experiments on the reſiſtance of the air.

In the ſecond treatiſe, relative to fire-arms, the author applies to practice the principles which he had eſtabliſhed in the former. He begins with obſervations on the reſiſtance of fire-arms; examining the hardneſs and tenacity of the metals employed in their conſtruction, and giving at the ſame time the method of refining and fuſing them, with remarks on the ſeveral proportions in which they are to be combined. Making afterwards ſome obſervations on the windage, figure, length, and caſting, of braſs guns and mortars, he points out the inconveniences ariſing from 'the running at the vent,' and concludes with the ſeveral methods of proving and examining new guns. The ſecond part of the treatiſe relates to projectiles. Here he explains the duty of an artillery-officer, both on battery and in the field, as far as regards the initial velocity of ſhot, the path of the ſhot's flight, and its effects upon works; calculating the number of men that may be killed or wounded in action, both by round and caſe-ſhot, fired from guns of different calibres, at various poſitions of the enemy. He draws a compariſon between the effects of the howitzers and field-pieces, and finiſhes with a chapter on ſhells projected from mortars.

The author, proceeding in the natural order of inveſtigation, treats, in the third work, of the ſervice of artillery in time of war, and begins with the attack of places. He firſt developes the diſpoſitions for laying ſiege to a fortified town, and determines the proportion of guns and ſtores for the attack of fortreſſes. He next treats of the precautions neceſſary to be taken for inſuring the ſafety of the convoys; the ſituation of the park; the conſtruction of the firſt, ſecond, and third batteries; the attack of the countermines, and the ſurrender of the place; diſtinguiſhing the ſeveral kinds of ſieges, and giving directions for diſmantling and blowing up the works of a reduced fortreſs. The ſecond part comprehends the whole ſcience of defence; enlarging particularly on the ſubject of mining, and delivering rules for the defence of a place conſtructed on a ſyſtem of demolition. The third part treats of the field-ſervice of artillery. The author, in order to give artillery-officers an adequate idea of this eſſential branch of their profeſſion, takes a view of the formation of an army, and the ſyſtem of tactics; laying down, at the ſame time, diſpoſitions for the march and encampments of armies, and for parking the artillery. He afterwards delineates the method of diſpoſing the artillery in the day of action; and explains its uſe in the attack and defence of field-works, with the principles of their conſtruction, either for covering a country or entrenching an army; and concludes with the duties to be performed in cantonments and winter quarters.

The

The three treatiſes above mentioned form the ſubject of the preſent work, which contains a complete ſyſtem of artillery and engineering. In this art, as in every other province of human inquiry, there will always be a diverſity of opinions; and future experiments alone can determine with reſpect to their comparative juſtneſs. The principles of M. D'Antoni ſometimes militate againſt the concluſions of the ingenious and learned Dr. Hutton: but we would not, on that account, conſider the tranſlation of the Italian work as ſuperfluous; ſince the points on which thoſe eminent men agree may be regarded as fixed axioms, and thoſe in which they differ may prove the means of exciting farther inveſtigation. Dr. Hutton, for inſtance, affirms that no ſtreſs whatever is to be laid on the wadding of guns, with reſpect to increaſing the force of the charge. D'Antoni, however, aſſerts the contrary; and in this he is ſupported by Colonel Thomſon, who has favoured the world with ſeveral ingenious papers on gunnery. We ſhall lay before our readers a few obſervations on this ſubject, taken from the tranſlator's preface:

'There are ſome points in which M. D'Antoni differs widely from the commonly received opinions: in his proportion of ordnance and ſtores for the attack and defence of places, he omits howitzers and includes a large proportion of mortars. It is doubtleſs an object highly worthy the attention of profeſſional men to inveſtigate, how far mortars can, in moſt caſes, ſupply the place of howitzers. The abſurd idea of fixing them in their beds at a certain elevation, is at length, to the credit of the preſent day, in a fair way of being exploded: the adoption of Captain Lawſon's mode of elevation, which ſeems at once to unite ſtrength and ſimplicity, the two leading features in military mechanics, will go far toward the completion of this object. The field-howitzer, notwithſtanding the apparent fairneſs of M. D'Antoni's compariſon, will ſtill maintain its ground: it is true, as he aſſerts, that the moral effects of howitzer-ſhells cannot be calculated; yet, ſuch is the conſtitution of human nature, that though we cannot aſcertain to mathematical preciſion the force of terror, we are nevertheleſs certain that it works wonderful effects on the moſt ſtupid as well as on the moſt enlightened minds. His general condemnation of light ſhort guns is deduced from the faireſt of all principles; the only true criterion to judge of the efficacy of field artillery, is their relative effects when compared with muſquets; whenever the fire of artillery can only produce an effect a little greater than a few miles of muſqueteers can, no man who conſiders impartially the advantages and diſadvantages attending the uſe of each fire-arm will heſitate to declare that the artillery ſhould be diſuſed. In ſaying this there is no reaſon to dread that artillery will loſe any of its credit; profeſſional men will ever know how to eſtimate its conſequence; it is only by bringing forward guns that cannot produce the effect expected from them, that the ſervice of artillery can be brought into diſrepute.'

It muſt be obſerved that M. D'Antoni has adapted his directions for the conduct of officers to the meridian of his own country. A compariſon between the Engliſh and Sardinian artillery will ſhew that there are many points in which the former is ſuperior; but this can detract nothing from the juſtneſs of the author's general principles, nor in any degree invalidate his obſervations. In one reſpect, the difference of the two ſervices is remarkable. Amongſt us, the engineers are accuſtomed to conſtruct the batteries, the artillery-officer having little more to do than to prepare the ſtores and fight the guns. In the Sardinian, and in moſt other ſervices on the continent, the artillery officer plans the batteries in conjunction with the engineer, and conſtructs them himſelf.

The tranſlator informs us that he had, at one time, an intention of ſubjoining, by way of note, remarks on the ſeveral concluſions drawn by the author in the courſe of this work; and comparing them with the received opinions of the Engliſh and French artilleriſts; but he afterwards relinquiſhed the idea, from the conſideration that an ample diſcuſſion of thoſe ſeveral points would not only have greatly enlarged the work, but might have involved him in tedious and fruitleſs controverſies. We cannot but wiſh that ſo uſeful a deſign had been carried into execution by a perſon ſo well qualified for the undertaking as the preſent tranſlator. He has, however, performed an eſſential ſervice to Britiſh artilleriſts and engineers, by the tranſlation of M. D'Antoni's elaborate work; and we muſt add, that he has not only given the ſenſe of his author with fidelity and accuracy, but with perſpicuity and conciſeneſs.

ART. IX. *A Letter to a Nobleman; containing Conſiderations on the Laws relative to Diſſenters, and on the intended Application to Parliament for the Repeal of the Corporation and Teſt Acts. By a Layman.* 8vo. 3s. Cadell. London, 1790.

IT has been obſerved again and again, and it has been particularly inſiſted on by Mr. Hume, that deiſm, and all religions that imply an unity of faith and one object of worſhip, are in their natures intolerant; that polytheiſm, on the contrary, with a diverſity of gods, admits a diverſity of religious ceremonies and opinions. The progreſs of knowledge, which is accompanied by progreſſive moderation and doubt, appears to have had a ſimilar effect on the minds of men, with regard to religious toleration, to that of polytheiſm, which is, no doubt, founded on ignorance. In the preſent enlightened age men ſpeculate freely on the nature and ways of fate and providence; and great

great indulgence is ſhewn to that variety of opinions which are entertained on ſubjects ſo abſtruſe and hard to be comprehended. In ſuch times and circumſtances it is not to be wondered that the new legiſlature of France, one of the moſt refined nations in the world, ſhould ſhew the moſt perfect example that has been yet exhibited, of toleration and forbearance in matters of religion.

The political advantages that muſt accrue to France from ſuch enlarged views and liberal conduct are foreſeen by the author of this treatiſe in favour of a repeal of the corporation and teſt acts in England. 'My firm and conſcientious opinion,' ſays he, 'is for a repeal; and ſure I am that, unleſs ſomething 'material ſhall be done by the wiſdom of the legiſlature to mi-'tigate the intolerance of our laws, a neighbouring nation, 'whoſe government was the conſtant ſubject of our reproba-'tion and abhorrence, will be ſoon found the trueſt aſylum for 'religious liberty.' The writer of the letter proceeds to vindicate, recommend, and aſſert religious toleration in general, and the exerciſe of juſtice to the proteſtant diſſenters in particular, from topics drawn from hiſtory, philoſophy, political prudence, and from the pure ſource of the Chriſtian religion, uncontaminated by human paſſion and the artifices of prieſtcraft. He is not only acquainted with the hiſtory and preſent ſtate of modern Europe, and particularly that of England, but is a conſiderable proficient in general knowledge. He writes in an eaſy and perſpicuous ſtyle, as might be expected from one ſo thoroughly maſter of his ſubject; and in that diſpaſſionate and liberal manner which becomes an advocate for toleration in matters of religious opinion. The political ſentiments of this writer are highly independent, and favourable to the rights of human nature.

ART. X. *Bell's New Pantheon, or Hiſtorical Dictionary of the Gods, Demi-gods, Heroes, and fabulous Perſonages of Antiquity; alſo of the Images and Idols adored in the Pagan World; together with their Temples, Prieſts, Altars, Oracles, Faſts, Feſtivals, Games, &c. as well as Deſcriptions of their Figures, Repreſentations, and Symbols, collected from Statues, Pictures, Coins, and other Remains of the Ancients. The whole deſigned to facilitate the Study of Mythology, Hiſtory, Poetry, Painting, Statuary, Medals, &c. and compiled from the beſt Authorities. Richly embelliſhed with characteriſtic Prints.* 4to. 2 vols. 1l. 11s. 6d. boards. Bell. London, 1790.

THE heathen mythology, hitherto little regarded but by claſſical ſcholars, will no doubt, by the pleaſing form in which it is here exhibited, become much more generally known.

The

The plan of a dictionary is alſo well calculated to convey this ſpecies of knowledge. An account of fabulous perſonages, to illuſtrate a paſſage in poetry, or a ſcene in painting, derives merit from its brevity, and from the eaſe with which it can be referred to. The matter of theſe volumes ſeems to be well ſelected, and arranged in a judicious manner; and the ſtyle has as much claim to elegance as can be expected in a dictionary of heathen deities. That our readers may form a judgment of it themſelves, we ſhall preſent them with the following account of the elyſium of the ancients:

'ELYSIUM, or elyſian fields; the happy abodes of the juſt and good, and the contraſt of Tartarus, the priſon of the wicked. It were endleſs to give all the variety of deſcriptions which this ſubject has afforded to ancient and modern writers. Let us figure to ourſelves ſcenes of enchantment abounding with every thing conducive to happineſs; an eternal ſpring of verdure and flowers, with fountains and ſtreams gliding gently along; a ſky always ſerene, and fanned with fragrant breezes; an univerſal harmony and uninterrupted joy; a perpetual ſpring, with other ſuns, and other ſtars. Lucian has given a romantic deſcription of theſe happy fields:

'We were conducted,' ſays he, 'to the city of the iſland of the bleſſed, to aſſiſt at their feaſts: at our entrance we were raviſhed to behold a city of gold encompaſſed by walls of emerald, whilſt its pavement was inlaid with ebony and ivory. The temples were of rubies and diamonds, having large altars raiſed upon one ſingle precious ſtone, on which hecatombs were ſeen to ſmoke. Its ſeven gates were all of cinnamon, ſurrounded by a moat of ſweet-ſcented luſtral-water, an hundred yards broad, and as deep as was neceſſary to bathe at one's eaſe. The public baths are of admirable artifice, which are heated by nothing but faggots of cinnamon. The edifice itſelf is of cryſtal, and the baſons or lavacra large veſſels of porcelaine, filled with dew. The bleſſed are incorporeal and impalpable; yet they eat and drink, and perform the other natural functions; they never grow old, but enjoy perpetual youth and vigour. Of all the ſeaſons they know none but the ſpring, and feel no other wind but the zephyrs. The earth is covered with flowers and fruits all the year round, which are gathered every month. There are three hundred and ſixty-five fountains of freſh water, as many of honey, and four hundred, but ſmaller than the others, of ſweet unguents, with ſeveral rivers of milk and wine. They keep their feaſts without the city in the elyſian fields, under the ſhade of a wood which ſurrounds it, ſitting upon beds of flowers, and have their refections brought by the winds. They are at no pains to make garlands, for the little birds which hop round them ſinging, ſcatter flowers upon them, cropt from the neighbouring meadows. They never ceaſe ſinging during the banquet, and rehearſing the moſt pleaſing verſes. Their dances are performed by boys and virgins, and their muſicians are Eunomus, Arion, Anacreon, and Steſichorus. When they have finiſhed their ſongs, a ſecond choir of muſicians appear, compoſed of

of ſwans and nightingales, which, with the zephyrs, make up a delightful concert. But what contributes moſt to the felicity of the bleſſed is, that there are two ſprings, the one of laughter, and the other of joy, of which each perſon drinking before he ſits down, is filled with hilarity for the reſt of the day.'

We have remarked that the typography of Mr. Bell is generally uncommonly elegant; nor will the public expectation be diſappointed in theſe volumes, the value of which is doubly enhanced by beautiful engravings, which ſerve not only to embelliſh the work, but to illuſtrate the ſubject of which it treats.

FOREIGN LITERATURE.

ART. XI. *Journal Hiſtorique du Voyage de M. de Leſſeps, &c.*

ART. XI. *Hiſtorical Account of a Journey from Kamtſchatka to France, by M. de Leſſeps, ſent out by the King as Interpreter in the Expedition of the Count de la Perouſe.* 8vo. 2 vols. Paris, 1790.

GRAND enterpriſes, undertaken for the purpoſe of making diſcoveries and promoting the cauſe of ſcience, generally arouſe the rivalſhip of ſurrounding nations, and one ſovereign is ſometimes incited, by the example of another, to purſue meaſures that are equally beneficial to mankind and honourable to himſelf. The voyages of our immortal navigator, whoſe unfortunate and untimely end will be lamented while the glory of his name ſurvives, ſeem to have diffuſed abroad a ſpirit for ſetting on foot expeditions of the like kind; and both France and Spain have turned their attention to the ſame objects, particularly the former, which in 1785 fitted out two frigates, well equipped, under the command of the Count de la Perouſe and M. de Langle, both able officers, in order to make reſearches reſpecting geography, aſtronomy, natural hiſtory, and other branches of knowledge. Two aſtronomers, M. Dagelet, of the Academy of Sciences, and M. Menge, junior, profeſſor at the Military School, embarked in theſe veſſels; but as the latter could not endure the nauſea of a ſea voyage, he was obliged to return ſome time after. Count de la Perouſe was attended alſo by the Chevalier de Lamanon and M. Monge, junior, canon of Sainte Genevieve, two gentlemen well acquainted with experimental philoſophy, by three naturaliſts, M. Martiniere, Father Recours, a cordelier, and M. du Freſne; by M. Moneron, an engineer, and by ſeveral painters and draughtſmen. Theſe learned men were preſented to the king on the 18th of June,

June, ample inſtructions were given them, and no expence was ſpared to provide them with ſuch inſtruments as they might have occaſion for. A medal was ſtruck to preſerve the remembrance of this enterpriſe, undertaken in the tenth year of the reign of Louis XVI.

Theſe veſſels, one of which was called La Bouſſole and the other L'Aſtrolabe, ſailed from Breſt on the 1ſt of Auguſt, 1785. The former had on board one hundred and thirteen men, and the officers were ſelected from the moſt reſolute and ſkilful in the French navy. Very ſanguine hopes were formed of the information that would be procured by this voyage; and Mr. Dagelet was particularly ordered to make obſervations on the tides, and on the pendulum, in order to aſcertain the variations of gravitation in ſeveral parts of the globe; on the difference it may have in the two hemiſpheres, and on the exact figure of the earth. For this purpoſe Mr. Dagelet carried with him the invariable pendulum of M. de la Condamine, which had been before uſed in America, Africa, and Lapland.

After making ſome obſervations at Teneriffe, M. de la Perouſe purſued his voyage, about the end of Auguſt, and proceeded thence to Brazil, the coaſt of Chili, the Eaſter and Sandwich iſles, California, &c. and arrived at China in the beginning of the year 1787. After this he proceeded to the Manillas, and the harbour of St. Peter and St. Paul in Kamtſchatka, where M. de Leſſeps quitted the veſſels in order to return to Europe.

In the month of June laſt year letters were received from theſe navigators, dated March 1788, at which time they were at Botany Bay, on the coaſt of New Holland; and it appears that M. de Langle, who commanded the Aſtrolabe, and who was one of the ableſt officers in the French ſervice, was killed at the iſle of Mohona, with thirteen of the crew, among whom were the Chevalier de Lamanon and Father Recours, a cordelier, both well verſed in natural hiſtory. This iſland lies in the Archipelago, called by Bougainville, Navigator's Iſles, in long. 208° and lat. 14° ſouth. After the death of M. de Langle, M. de Clonard took the command of the Aſtrolabe, and the two veſſels ſailed from Botany Bay about the middle of May 1788. Though above a year has now elapſed ſince that period, no accounts have been yet received of the future progreſs of the Count de la Perouſe; and there is too much reaſon to apprehend that ſome misfortune has befallen the veſſels, or that they are loſt. If this be the caſe, ſcience will undoubtedly ſuffer by the miſcarriage of an enterpriſe undertaken by munificence, ſupported by liberality, and entruſted to the management of men every way qualified, by their talents and experience,

to

to bring it to a happy concluſion. But no human prudence can guard againſt the dangers of the ocean, the conſpiring elements, or deſtructive rocks; and unforeſeen accidents often render the beſt concerted voyages abortive.

After quitting the veſſels, M. de Leſſeps departed from St. Peter and St. Paul on the 7th of October, 1787, accompanied by ſeveral Ruſſian gentlemen, four ſerjeants, and a like number of ſoldiers, and purſuing his route through Yakoutſk and Irkoutſk, near the lake Baikal, proceeded to Tobolſk, the capital of Siberia, from which he travelled to Peterſburgh, and thence to Paris, where he arrived on the 17th of October, 1788.

As M. de Leſſeps undertook this journey neither for pleaſure nor to make diſcoveries, the reader muſt not expect in it that information or entertainment which is generally ſought for in books of travels. He himſelf ſeems to have been ſenſible of this, for he very modeſtly gives it the title of a Journal; but he has made ſuch obſervations on the countries through which he paſſed, and the manners and cuſtoms of the inhabitants, as time and circumſtances would permit. That our readers may judge for themſelves we ſhall give a few extracts from the work.

'The people of Kamtſchatka,' ſays M. de Leſſeps, 'are of a mild and hoſpitable diſpoſition; they are neither thieves nor robbers; and they even poſſeſs ſo little cunning, that one may eaſily deceive them by taking advantage of their fondneſs for ſtrong liquors. They live together in the greateſt harmony; and it appears that they are the more induced to this on account of the ſmallneſs of their number. This union leads them to aſſiſt each other mutually in their labours; and this is no ſmall proof of their deſire to oblige, if we conſider their natural lazineſs, which is very great. An active life to them would be inſupportable; and the greateſt happineſs, in their opinion, next to that of getting drunk, is to have nothing to do, and to enjoy themſelves in indolence. This diſpoſition is ſo powerful amongſt theſe people, that it makes them neglect the means of providing the neceſſaries of life; whole families may ſometimes in winter be ſeen reduced to the extremity of want, becauſe they did not give themſelves the trouble, during the ſummer ſeaſon, to lay up a proper proviſion of fiſh, which is almoſt their only nouriſhment. If they thus forget what concerns their exiſtence, it may be readily concluded that they are equally careleſs with reſpect to cleanlineſs, which appears neither in their perſons nor their habitations; on the contrary, we may reproach them with being exceedingly dirty. Notwithſtanding this ſlovenlineſs, and other natural faults, we are obliged to regret that their number is ſo inconſiderable; for, from what I have ſeen, and what was confirmed to me by ſeveral people, if you wiſh to meet with

ſentiments

ſentiments of honour and humanity, you muſt ſearch for them among the real Kamtſchadales; they have not yet bartered their rude virtues for the poliſhed vices of the Europeans ſent thither to civiliſe them.'

Moſt travellers have obſerved that ſavage nations become profligate and degenerate in proportion to the intercourſe which they have with the Europeans. Mr. Vaillant, who lately returned from travelling into the interior parts of Africa, remarks the ſame thing when ſpeaking of the Hottentots, and, by contraſting the character of different tribes, ſhews the vaſt difference there is between thoſe who live under the Dutch government, and thoſe to whom its influence has never yet been extended. The following reflections of M. de Leſſeps ſtill tend to confirm this aſſertion:

'At Bolcheretſk I firſt began to perceive the effects of their influence. I ſaw there, in ſome meaſure, the traces of European manners ſtill remaining among the inhabitants, in their motley race, in their idiom, in the conformation of their features, as well as in their diſpoſition and manner of living, which do not always announce a great ſtock of virtue. This remarkable difference between them and the original inhabitants ariſes only from an introduction towards civiliſation; and the following are the reaſons upon which I found my opinion:

'Bolcheretſk was not long ago the capital of Kamtſchatka, eſpecially from the time that the governors thought proper to eſtabliſh their reſidence there. The chiefs and their attendants carried thither the European manners and cuſtoms: it is well known that theſe are generally changed when tranſmitted; and this change becomes more perceptible in proportion to the diſtance from their ſource to which they are diffuſed; but it is to be hoped that the Ruſſian government will, as much as is poſſible, entruſt its authority, and the execution of its orders, to officers only of approved merit, if I may judge from thoſe who are there at preſent; and if this precaution be taken, it is to be preſumed that theſe officers, in the places where they reſide, will give no examples but ſuch as diſplay the virtues, knowledge, and other eſtimable qualities of civiliſed people.'

The fair ſex, in all ages, have been fond of pleaſure; and this paſſion is confined to no country or climate. It appears under the ſcorching beams of the tropical ſun, and is not checked by the cold atmoſphere of the northern regions. Thoſe of Bolcheretſk, according to our author's account, are not deficient in this reſpect.

'With regard to the women of Bolcheretſk,' continues he, 'who came to our aſſemblies, and who, for the moſt part, were of a mixed breed, or born of Ruſſian parents, I obſerved that their

their faces in general were not diſagreeable. I even ſaw ſome who might be accounted pretty; but the freſhneſs of their complexions does not continue long; and it is doubtleſs their bringing forth children, or the ſevere labour to which they are ſubjected, that makes them thus wither almoſt in the flower of their age. They are of a cheerful diſpoſition, and extremely lively, perhaps a little at the expence of decency; they ſeek of their own accord to amuſe thoſe among whom they are, by every expedient that mirth and joy can ſuggeſt; they are alſo fond of ſinging, and the ſound of their voice is ſoft, and far from being diſpleaſing; it is only to be wiſhed that their muſic had not ſo great a reſemblance to the climate, or that it approached nearer to ours. They ſpeak both the Ruſſian and Kamtſchadale languages; but they all preſerve the accent of the latter. I did not expect to ſee the Poliſh dances here, and ſtill leſs country dances in the Engliſh taſte. Who would believe that the ladies here had any idea of the minuet? Whether it was that my being at ſea for twenty-ſix months had rendered me leſs difficult, or that the remembrance of former ſcenes, which this ſpectacle revived, had faſcinated my eyes, I thought theſe dances executed with more preciſion and grace than I could have imagined. The dancers of whom I ſpeak carry their vanity ſo far as to diſdain the ſongs and dances of the Kamtſchadales. In order to finiſh my obſervations upon theſe balls, I muſt ſay, that the women are not negligent in their dreſs; they ornament themſelves with the moſt elegant articles which they poſſeſs, or conſider as of the greateſt value. Theſe dreſſes of ceremony conſiſt principally of ſilk; and, from what I have written on their commerce, they muſt coſt very dear. I ſhall here add a remark which I had an opportunity of making both in theſe aſſemblies and in thoſe of the Kamtſchadales, at which I was afterwards preſent: It is that the greater part of the huſbands, whether Ruſſians or natives, do not appear to be jealous; they readily ſhut their eyes on the conduct of their wives, and are very indifferent on this point.'

We ſhall conclude our extracts from this work, the ſtyle of which we cannot call either elegant or correct, with an account of the manner in which the Kamtſchadales hunt bears:

'They attack them various ways, and ſometimes lay ſnares for them. Under a heavy trap, ſupported by a pretty high ſcaffold, they place a bait of ſome kind or other to attract the bear, which no ſooner ſmells it than he approaches to devour it; by doing this the animal ſhakes the feeble ſupporter of the trap, which, falling upon his neck, puniſhes his voracity by cruſhing his head, and ſometimes his whole body. In paſſing through the woods I have ſeen many of them caught in this kind

kind of trap, which remains ſuſpended until a bear is killed by it; and a year often expires before that happens. This manner of hunting bears, it may be ſaid, neither requires a great ſhare of courage, nor ſubjects the hunters to great fatigue; but there is another method employed in this country, for which both ſtrength and courage are neceſſary. Whether accompanied or alone, a Kamtſchadale ſets out in queſt of a bear, with no other arms but his fuſee, a kind of carabine, the but-end of which is very ſmall, a lance, and his knife. All his proviſions are confined to a packet, containing about a ſcore of dried fiſh; and with this ſlender proviſion he penetrates into the thickeſt woods, and ſearches ſuch places as are frequented by the animal. He generally poſts himſelf among ſome buſhes, or the reeds that grow on the borders of lakes and rivers, where he boldly waits with patience; if neceſſary he will remain thus on the watch for a whole week, until a bear makes his appearance, and as ſoon as he perceives him, he fixes in the earth a forked ſtick, in order to ſupport his muſquet. By the help of this ſtick he is enabled to hold his piece with more ſteadineſs, and to take a ſurer aim. Though he uſes only a ſmall bullet, he ſeldom fails to hit the animal, either in the head or the ſhoulders, which are the moſt ſenſible parts; but he muſt inſtantly reload, for if the bear does not fall on the firſt diſcharge, he ruſhes furiouſly on the hunter, before he has time to fire again. In ſuch a caſe he has recourſe to his lance, in order to defend himſelf from the animal; but his life will be in great danger if he does not mortally wound the bear; and it may be readily conceived that in theſe combats the hunter is not always the conqueror. This, however, does not prevent the inhabitants from expoſing themſelves in them almoſt every day, though they frequently ſee others periſh. They cannot ſet out upon a hunting excurſion of this kind without reflecting that they muſt either conquer or die; but the idea of this ſevere alternative neither intimidates nor checks them.'

We obſerve that an Engliſh tranſlation of this work is adverti ſed to be publiſhed.

MONTHLY

MONTHLY CATALOGUE

For MAY 1790.

MISCELLANEOUS.

ART. 12. *Female Characters in Married Life; an Epigrammatic Satire. Humbly addreſſed to the Wife without a Fault.* 4to. 2s. 6d. Stalker. London, 1790.

THIS poem is, in many parts, much too coarſe for the politer circles, which is the more to be lamented becauſe it abounds in paſſages neither deficient in point, or deſtitute of force. As a ſpecimen, we have ſelected the following from the various characters of wives pourtrayed by this ingenious ſatiriſt:

'Little accompliſhments are dangerous things;
Genius too oft from brackiſh fountains ſprings.
Theſe only pleaſe which harmoniſe the mind,
Improved with ſkill and by true taſte refin'd.
The one to muſic broke, with thrilling note,
Rattles a tortur'd language in her throat;
Whilſt harſh guitars and jingling forte-pianos,
Mingling Scotch ballads with Italianos,
Like the winds whiſtling thro' monaſtic cells,
Ring thro' the houſe in diſcord's ſhrilleſt yells.
Repentance, thus too late, comes on too ſoon;
All the domeſtic joys put out of tune!
The genius, prone to painting, pictures draws
Of all her friends, and at one price applauſe.
Her jackall huſband, as in office bound,
Hangs in diſtortions all his friends around.
* * * * * * * *
The ſcandal-bearer, who ſets off at view
The game by others ſtarted to purſue;
Who blows Fame's trumpet at the ſmalleſt end,
Which, ſpreading wide, does the loud blaſt diſtend;
From houſe to houſe with buſy pleaſure flies,
And ſtabs the bleeding victim as it dies.
What prowling tygreſs of the plains or woods,
What ſhark-tooth'd monſter of the ſeas or floods,
What hungry vulture of the tuneful groves,
Diſturber of their people's happy loves!
Can with this monſter of earth, ſea, and air,
In wanton, ſavage cruelty compare.
Ill-fated huſband! who, to bribe his reſt,
Muſt take the ugly monſter to his breaſt!'

There are inhabitants of a ſmoaky metropolis who will be wicked enough to apply this laſt character. There are many others drawn with equal juſtice; and we again lament that the coarſeneſs of ſome ſhould prevent our recommending the book to general uſe.

ART. 13. *Love in many Maſks; as altered by J. P. Kemble from Mrs. Behn's Rover, and firſt acted at the Theatre-Royal in Drury-Lane, March 8th,* 1790. 8vo. 1s. 6d. Egerton. London, 1790.

This comedy, ſo ill-ſuited to the preſent improved ſtate of the Engliſh theatre, ſeems to have been revived for the purpoſe of exhibiting that faſcinating favourite of the town, Mrs. Jordan. With her aſſiſtance no doubt the piece may go off very well; but neither the ſtructure of the fable, the great number of characters, nor the boldneſs with which many of them are drawn, are conſiſtent with that correctneſs the town at preſent requires. But the greateſt inconvenience to the ſpectator is the number of perſons with which the ſtage teems at the ſame time. Horace is unwilling to admit four—the play before us frequently exhibits ſeven, and moſt of them maſked, to increaſe the puzzle of the audience. This obliges the characters to be perpetually telling one another or themſelves what *they* know very well, but what the audience could not otherwiſe diſcover; and requires ſo many ſide ſpeeches and over-hearings, that one cannot help wondering how it is poſſible the different groups of actors ſhould avoid ſeeing each other, if they have the good fortune to keep from treading on each other's toes.

On the whole, we may venture to aſſert that as long as the town continues to be enchanted by Mrs. Jordan, 'Love in many Maſks' will live; but whenever we have the misfortune to loſe her, it muſt ſleep till another actreſs of equal merit in the ſame line appears.

ART. 14. *The Sick Laureat; or, Parnaſſus in Confuſion: a Poem. In which the Merits and Defects of ſome of our principal modern Poets are aſcertained.* 4to. 2s. Kearſley. London, 1789.

A report of the laureat being ſick, calls together a variety of *characters*, for all of them cannot, without a ſtrong figure, be called *poets*, to Hatfield, in order to exhibit their pretenſions before Lord Saliſbury. After as many as our bard chooſes to exhibit have made their appearance, Warton recovers, and preſſing this the remaining crowd relieves the peer

From the fatigues of the profeſſor's chair.

By the following lines the reader may judge of the merit of the piece:

'Derby diſmiſs'd, Pratt next advanc'd to ſpeak,
Once Courtney Melmoth ('twas a childiſh freak)
With honey'd flattery, his long practis'd trade,
His ſoft attack upon the peer he made:
'Illuſtrious ſon of an illuſtrious ſire,
'Whom poets worſhip, and whom all admire;

'I

'In ev'ry feature of thy godlike face
'Shines attic wit, true judgment, ſenſe, and grace.
'Thy lovely wife, juſt in her youthful prime,
'Calls in no art to hide the chinks of time;
'No art ſhe wants, in maiden tranſports wild;
'She's juſt between the woman and the child.
'Oh thou art all!'—'Arreſt thy cloying treat,'
The peer replied; 'the doſe is much too ſweet:
''Tis true we love the ſoothing voice of praiſe,
'When well wrapp'd up in ſmooth and artful lays;
'But praiſe like thine is quite another matter;
'So undeſerved 'tis the ſevereſt ſatire;
'With hand unſkilful to the work you ruſh,
'And daubing trowel, not a fine hair'd bruſh.'

The *judge-marquis* ſays a great deal more; and if it be really with an intention to recommend Mr. Pratt's former publications, as well as a poem he is preparing for the preſs, the *puff indirect* is managed with very great addreſs.

ART. 15. *A Letter on the Practice of Boxing. Addreſſed to the King, Lords, and Commons. By the Rev. Edward Barry, A. M.* 8vo. 1s. Bew. London, 1789.

The practice of the ancient Greeks and Romans having been adduced in vindication of boxing, the author of this letter endeavours to ſhew that, whatever may have been the taſte of thoſe times, ſuch rude examples ought never to be objects of imitation; that they are repugnant to the laws and maxims of a civiliſed ſtate, evince but little courage, diſcover much barbarity, and, without being of any advantage to the community, are productive of much evil.

ART. 16. *A poetical Epiſtle to John Wolcot, commonly known by the Appellation of Peter Pindar.* 4to. 1s. Riebau. London, 1790.

There are a number of ſcribblers, who, having no merit of their own, endeavour to riſe into notice by faſtening themſelves on ſome popular author. Any literary production which is ſucceſsful, is always ſure to produce imitators, who, taking advantage of the popularity of the original, endeavour to ſell their traſh of imitation or abuſe. Thus Sterne was imitated by thoſe who had pretenſions neither to humour nor ſentiment; and thus our friend Peter Pindar is unmercifully laſhed by many, whoſe only talent at ſatire is ſcurrillity and calling names. Peter, we own, is liable to reprehenſion; the freedom he uſes with majeſty, and his other perſonalities, can neither be juſtified or excuſed. But to give efficacy to the rod, it muſt be placed in abler hands than thoſe who have yet aſſumed it. There is not one good line in the performance before us. Of this ſort of traſh we have already had enough; and it is time that gentlemen ſhould be weary of writing what we are moſt heartily tired of reviewing.

ART. 17. *De Montmorency; a Novel: founded on a recent Fact; interſperſed with the Tranſlation of an original Manuſcript found in the Baſtile.* 12mo. 2 vols. 5s. Bar. London, 1789.

Though theſe volumes are not likely to become ſtandard, or even *parlour-window books*, they are ſuperior to moſt of the haſty productions of a ſeaſon, and will be found uſeful in the chamber of a convaleſcent, or to relieve the *ennui* of a watering-place.

ART. 18. ΑΝΑΛΕΚΤΑ ΕΛΛΗΝΙΚΑ *ſive Collectanea Græca ad uſum Academicæ Juventutis accommodata. Tom. I. &c. Editio Secunda emendatior.* 8vo. 8s. Murray. London, 1789.

We have the pleaſure to announce to the public the ſecond edition of a ſelection from the Greek authors, which a few years ſince we ſhortly took notice of; a work which is calculated to promote and facilitate the ſtudy of the Greek language.

This volume conſiſts wholly of proſe, the editor having informed us in his preface of his intention to publiſh a volume of poetry on the ſame plan. The taſk, in the accurate manner in which this is conducted, will require labour and time. The two volumes when completed, with the ſmaller Collectanea already publiſhed by the ſame editor, and which may ſerve as an introduction to both, will be valuable acquiſitions both to the ſtudent and teacher of the Greek language.

We cannot conclude without commending the diligence and learning which Mr. Dalzel has diſplayed in compiling this work. The public are certainly under obligations to thoſe who are content to devote their time to philological inquiries in order to ſhorten the paths of ſtudy to others.

POLITICAL.

ART. 19. *Subſtance of the Speech of the Right Hon. Edmund Burke, in the Debate on the Army Eſtimates in the Houſe of Commons, on Tueſday the 9th of Feb.* 1790; *comprehending a Diſcuſſion of the preſent Situation of Affairs in France.* 8vo. 1s. Debrett. London, 1790.

This pamphlet contains abſtracts of the ſpeeches of Mr. Burke, Mr. Fox, Mr. Sheridan, and Mr. Pitt, on the above ſubject. Mr. Burke's is principally attended to, and contains all that elaborate hiſtorical accuracy for which this ingenious orator is ſo juſtly famed. What he ſays of the French Revolution muſt ſtrike every thinking mind with aſtoniſhment. After admitting that by the artifice of Louis the Fourteenth, with a well-diſciplined ſtanding army, deſpotiſm was eſtabliſhed in France, 'that though this deſpotiſm was proudly arrayed in manners, gallantry, ſplendor, magnificence, and even covered over with the impoſing robes of ſcience, literature, and arts, it was in government nothing better than a painted and gilded tyranny; in religion an hard intolerance, the fit companion and auxiliary to the deſpotic tyranny which prevailed in its government.' After this gloomy deſcription of the ſtate of France before the revolution, we cannot help being ſurpriſed at the vehemence with which this

this philoſophical ſpeaker condemns all the abettors of the preſent changes. But as there are no proofs given of the authenticity of the publication, we ſhall forbear any further remarks.

ART. 20. *The Struggles of Sheridan; or, The Miniſtry in full Cry.* 4to. 1s. Kerby. London, 1790.

This author has at leaſt denominated his effuſion with propriety; for had ſuch tempting offers as he deſcribes ever been made to Mr. Sheridan, we may affirm, without any imputation derogatory to that gentleman, that it would have coſt him violent *ſtruggles* to reject them. The ſubject of this little poem is ſufficiently fantaſtic, and the verſification not unharmonious.

ART. 21. *Introduction to the Obſervations made by the Judges of the Court of Common Pleas for the Diſtrict of Quebec, &c.* 8vo. 1s. 6d. Stockdale. London, 1790.

Some late tranſactions in the diſtrict of Quebec have given riſe to unfavourable imputations on the judicial adminiſtration in that province. It would be unneceſſary for us to enter upon a detail of thoſe incidents, which indeed are not ſufficiently explained towards forming a ſatisfactory opinion on the ſubject. We hope the conduct of the parties, when duly examined, will appear in a leſs blameable light than has been repreſented to government. In the mean time, it is moſt conſiſtent with juſtice and candour to ſuſpend our judgment on thoſe affairs.

ART. 22. *Conſiderations on a Commiſſion of Bankruptcy; in which the ſeveral Advantages and Diſadvantages attending the Recovery of Debts by Commiſſion, &c.* 8vo. 1s. Brook. London, 1789.

The author of theſe conſiderations appears to have reflected on the ſubject with great attention. By the various and comprehenſive rules which he preſcribes for eſtimating the comparative advantages or diſadvantages, to a creditor, of taking out a commiſſion of bankruptcy, he furniſhes the reader with ſuch explicit directions as may apply, if not in every ſubordinate circumſtance, at leaſt in a general view, to all poſſible caſes of the kind. We can therefore ſafely recommend this production to all who are concerned, either perſonally or profeſſionally, in the tranſactions of which it treats. To the former it will convey much uſeful information; and with regard to the latter, it will greatly facilitate their practice.

ART. 23. *The Farmer convinced; or, The Reviewers of the Monthly Review anatomiſed, their Ignorance expoſed, and their vague, futile, and fallacious Aſſertions refuted, &c.* 8vo. 1s. 6d. Newberry. London, 1788.

As it might appear invidious in us to interfere in a controverſy of this kind, we ſhall only obſerve that the preſent author argues with a conſiderable degree of acuteneſs. He inveſtigates the ſubject minutely, and his remarks, in general, appear to be the reſult of experience.

DIVINITY.

ART. 24. *Apoſtolical Conceptions of God; being the Second Part of an antecedent Publication, and is more eſpecially addreſſed to the Favourers of the Arian and Socinian Perſuaſions.* Briſtol: printed for the Author, and ſold by Herdsfield, London. 8vo. 2s. 1790.

If this was the manner in which the apoſtles conceived, it is happy for us uninſpired Chriſtians that they brought forth differently. We have read our author's conceptions in every different direction, croſs-ways, backwards, from the bottom upwards, and beginning at the end; in all ways we have found it as unintelligible as in the ſtraight-forward way. But as one claſs of our readers may be fond of ænigmas, we would take the liberty of propoſing the following for their own and our edification:

'FIRST POSITION.

'Firſt. *Jeve, or Jeſus Chriſt, is exhibited to us, in the following paſſages, as two diſtinct perſonalities.*

'*Iſa.* ix. 6. For unto us' (Jeve Adni and Jeve of Hoſts) 'a child is born, unto us a ſon is given' (by the Holy Father) 'and the government ſhall be upon his ſhoulders, and his name ſhall be called wonderful, the mighty God' (our own known name), 'the Aionian father,' &c. *Ezek.* viii. 1—3. 'The hand of Jeve (Adni) fell upon me; and to the appearance of fire from his loins downwards, and from his loins alſo upwards, and he' (Jeve Adni) 'put forth the form of an hand, and took me by the lock of my head, and the ſpirit' (which was manifeſtly preſent with him), 'lift me up between the earth and the heaven, and brought me to Jeruſalem, to the door of the inner gate,' &c. *Prov.* ix. 10. 'The fear of Jeve is the beginning of wiſdom, and the knowledge of the Holy Ones' (namely of Jeve of Hoſts and his angelic proſopon) 'is underſtanding' (or the true wiſdom).'—Page 2 and 3.

Such as are fond of being puzzled, may open any other part of the book and be equally entertained.

ART. 25. *A Sermon preached for the Benefit of the Charity-School inſtituted at Upton upon Severn, in the Year* 1787. *By the Rev. Richard Sandilands, LL. D.* 8vo. 1s. Cadell. London, 1789.

Mercy is the ſubject of this diſcourſe, which is illuſtrated and applied with propriety. And trite as charity ſermons are now deemed, there is in this not only ſome novelty, but alſo ſome inſtruction. The reader who buys it in expectation of pleaſure and profit, will not be diſappointed. It is written with taſte, and calculated to affect every good mind, to ſoften the hearts of the ſelfiſh, and to improve the humanity of all.

ART. 26. *Sermons for Children; being a Courſe of Fifty-two, on Subjects ſuited to their tender Age, and in a Style adapted to the Underſtanding of the Riſing Generation; being an Attempt to counſel and improve their*

their Heart by occupying the Imagination; with an Hymn annexed to each Diſcourſe. The whole by the Rev. Mark Anthony Meilan. 12mo. 3 vols. 9s. London, 1789.

After ſo copious a title page, we have only to remark how far the execution is equal to what the author profeſſes. It is but juſtice to admit that the diſcourſes are all adapted to the age they are intended for. They are all ſhort, eaſily comprehended, and much pains is evidently taken to avoid any diſcuſſion of thoſe doctrinal points which are ſuited only to riper years.

ART. 27. *An Apology for the two Ordinances of Jeſus Chriſt, the holy Communion and Baptiſm.* 8vo. 1s. London, 1790.

This apology is written with great acuteneſs and force of argument. Mr. Applegarth, the author, had originally been of the ſect of the Quakers, but afterwards joined the communion of the Church of England. He combats the doctrines of the celebrated Barclay with much ingenuity, and clearly eſtabliſhes the celebration both of the holy communion and baptiſm upon the authority of the New Teſtament. We can perceive in the Apology ſome glimmerings of aſperity againſt the ſect which Mr. Applegarth has abandoned; but they lead him into no intemperate invectives, and ſerve only to enliven his refutation of their principal doctrines.

ART. 28. *The Influence of Chriſtianity on the Condition of the World; a Sermon preached in Trinity Chapel, Conduit Street, Sunday, December* 13, 1789. *By Thomas Coombe, D.D.* 8vo. 1s. Cadell. London, 1790.

Of this diſcourſe it is not eaſy to ſay whether elegance of compoſition, or its ſublimity, be moſt entitled to our praiſe. It is thus that the labours of the head, and the feelings of the heart, ſtrong reaſoning, and refined ſentiment, may be united and diſplayed with ſucceſs in eſtabliſhing the goſpel. And the author of this maſterly production ſets a laudable example of his attachment to the cauſe of religion, by avowing himſelf, in ſuch an age of faſhionable infidelity, a ſtrenuous advocate for its truth, from a ſerious conviction of its gracious and benign influence on the preſent condition of the world.

ART. 29. *A Vindication of the Honour of God, and of the Rights of Men; in a Letter to the Rev. Mr. De Coetlogon, occaſioned by the Publication of Mr. Edwards's Sermon on the Eternity of Hell Torments.* 12mo. 6d. Printed for the Author, and ſold by Johnſon. London, 1789.

In human concerns we ſay, *ſummum jus ſumma injuria*; but, without requiring any allowance in the Deity for human weakneſs, it is difficult to conceive any crimes committed in this life which cannot be expiated by torments continued for a finite ſeries of ages. This has appeared ſo reaſonable to the generality of mankind in all ages, that the idea of eternal torments has ever been a matter of doubt or concern to all true believers, and of ſcorn and ridicule to infidels.

At length the ſanction which a late learned divine* has given to the doctrine of the final reſtitution of all things, has had the deference paid to it which ſuch a character and the reaſonableneſs of the doctrine entitled it to. But the gloomy ſpirit of a ſect that has almoſt exiſted by its declamatory damnations, muſt ever be averſe to an opinion which would deprive their diſcourſes of more than half their efficacy.

Mr. Clarke defers entering very minutely into the texts adduced from ſcripture in favour of the old opinions, to a larger work, which he ſays is ready for the preſs, and which we hope will ſoon make its appearance.

ART. 30. *A Sermon preached in the Chapel of the Aſylum, on Sunday Morning, March 29, 1789. By the Rev. Septimus Hodſon, M. B. late of Caius College, Cambridge, Miniſter of Taviſtock Chapel, Long-Acre, and Chaplain in Ordinary to the Prince of Wales.* 8vo. 1s. Cadell. London, 1789.

Mr. Hodſon being accuſed by ſome anonymous writer of having preached at the Aſylum a probationary ſermon ſtolen from Dr. Ogden, very modeſtly apologiſes for obtruding himſelf on the public as an author, in order to obviate ſo unjuſt a calumny. The well-known moral character of Mr. Hodſon might have rendered his aſſertion ſufficient; but the peculiar delicacy of his ſituation, at that time a candidate for the chaplaincy of the Aſylum, made him conceive ſomething more might be neceſſary. He therefore requeſts his accuſer to move for his [Mr. Hodſon's] perſonal attendance before the guardians of the Aſylum, to produce his manuſcript, and that the ſaid accuſer will come forward with the volume from which he ſuſpects the ſermon to be ſtolen. As a farther challenge he propoſes the guardians ſhould require an affidavit that the ſermons printed are in ſubſtance the ſame as thoſe preached; and that they were compoſed by Mr. Hodſon, without the aſſiſtance of any ſecond perſon whatſoever. The event ſhews how well ſatisfied the majority of guardians were.

Of the Sermon we ſhall only ſay that, conſidering how hacknied the ſubject is, it is far above mediocrity. The ſentiments are juſt, forcibly expreſſed, and ſometimes new; the language is ſtrong and expreſſive; the periods round and flowing. The addreſs to the guardians, as ſuch, is moſt happily conceived.

The profits of the Sermon are appropriated to the benefit of the charity.

---

* Dr. Newton, Biſhop of Briſtol.

For the ENGLISH REVIEW.

NATIONAL AFFAIRS

For MAY, 1790.

THERE was never a more ſudden TRANSITION from the proſpect of peace and a growing revenue, to that of war with its concomitant difficulties and expence, than has happened in the courſe of theſe few weeks; for it is no longer, ſince the miniſter, on the great occaſion of deſcribing the ſtate of the nation, ſpoke as if we had now arrived at that happy period when all additional burthens were at an end, and when an accumulating ſinking fund would, by a rapid operation, liquidate the debt already contracted by the nation. Scarcely were the panegyrics on the miniſter, in conſequence of ſuch glad tidings, pronounced, when he again comes to parliament, and announces the probability of a war with Spain. His political adverſaries did not fail to expoſe him, by urging that he either foreſaw the probability of a rupture with Spain, when he opened the budget, or did not. If he did foreſee it, why, for the ſake of a pleaſing deluſion which a ſhort time muſt deſtroy, did he not then declare it? If he did not, where were all our foreign ambaſſadors, where that vigilance and ſagacity that ought to diſtinguiſh the miniſter of a great nation? Motions were made, in both houſes, for the production of ſuch papers as might point out, if not in all caſes the ſubſtance, (which, it was confeſſed, might in certain caſes be improper), yet the *dates* of the intelligence that he had received concerning the movements of Spain. Theſe motions were, and in our opinion wiſely, negatived. On this occaſion the conduct and character of the miniſter were examined, as might be expected, with unuſual ſtrictneſs and ſeverity. The fair proſpects on which he had reſted his merit and fame, peace and a reduction of the public debt, were ready to vaniſh; diſtreſs and new debts ſtared us in the face; the inſincerity of the miniſter, which had been manifeſted on ſome former occaſions, was, on this, tinctured with a degree of puerility. The habit of diſſimulation had grown upon him ſo ſtrong, that he exerciſed it even when it appeared to be unneceſſary. Such was the language of the adverſaries of Mr. Pitt.—On the other hand, it was contended, that as Mr. Pitt was not reſponſible for the motives that might urge the Spaniards to hoſtilities againſt England, ſo neither would it be prudent to declare even the *dates* of the intelligence concerning their movements. A compliance with a ſimilar motion, in the courſe of the laſt war, as was well obſerved by the Duke of Leeds, had dried up a very material ſource of public intelligence. The apparent inconſiſtency between the different appearances

pearances made by the miniſter in parliament, and the withholding papers, might ſeem to give his adverſaries a temporary triumph; but their triumph would not be laſting. The grounds on which he acted would be juſtified by events, and the diſcloſure of facts at a proper ſeaſon.

Men of candour and moderation neither joined the adherents of Mr. Pitt in their exaggerated praiſes, nor his adverſaries in their zeal to ſcrutiniſe his conduct with regard to the point in queſtion, and to inveigh againſt his general character. The great criſes of nations, whether proſperous or adverſe, depend on cauſes beyond the reach of ſtateſmen and princes. As Mr. Pitt ought not, by any aſſociation of ideas or illuſory power of the imagination, to be conſidered as the author of bleſſings that ſpring, under Providence, from liberty, commercial habits, enterpriſe, and extenſive capitals; ſo neither is he to be charged with the neceſſity of warlike preparations, nor called upon prematurely to give an account of his conduct as a *war-miniſter*, even before the war has commenced. A higher power than any political CHIEF or ſovereign, muſt be acknowledged both in the ſunſhine and the ſtorms that lour or fall on nations.—Setting aſide, therefore, the adventitious circumſtances of war or peace, we ought to draw our concluſions concerning Mr. Pitt ſolely from the premiſes of his own actions. But this is a ſubject on which we ſhall not at preſent enter. The opinion that is entertained of Mr. Pitt by the public will be ſhewn by

THE DISSOLUTION OF THE OLD AND ELECTION OF A NEW PARLIAMENT.

Concerning this ſubject there are various and contradictory reports and conjectures. What ſeems probable to us, at the preſent moment, is, if the miniſter, on the return of the meſſenger from Spain, foreſees nothing but war, he will diſſolve the parliament as ſoon as poſſible; that is, in the courſe of two, or at moſt of three weeks. If room is left, or ſhall appear to be left, for negociation, he will put off the diſſolution of parliament until he ſhall have aſſerted the honour of Great-Britain by ſome conceſſion or apology from Spain, which may maintain, or, as ſome would ſay, reſtore his popularity, and enable him thereby to call a general election with advantage.

THE THREATENED RUPTURE WITH SPAIN

Is a ſource of endleſs reflection and conjecture. The Spaniards, who were not diſarmed by the precipitate peace of 1783, continued to increaſe their ſtrength both at ſea and land. The ceſſion of Minorca, the Floridas, and the whole Moſquito Shore, inflamed the pride of a nation that reſted the glory of their monarchy very much on the boundleſs extent of their territory,

ritory, and who, with arms in their own hands, ſaw the Britiſh nation immerſed in commerce, and her miniſter placing his ſtability and glory chiefly in the accumulation of revenue; an object from which, they imagined, he would not be eaſily diverted. They took an emphatic proteſt againſt the ſettlement of the Engliſh at Nootka Sound, a portion of that coaſt of which, in conſequence of a famous papal bull, they claimed the excluſive property. In the mean time, the ſtorm that had been for ſome years gathering againſt the Houſe of Bourbon, in the centre of France, had begun to fall, and ſome preluſive drops announced a general commotion, not only in the colonies, but on the continent of Spain. In theſe circumſtances, the courts of Verſailles and Madrid, it is natural to conjecture, wiſhed to divert the attention of the people from the claims of men, to drown the murmurs of diſcontent in the din of war, and, by ſtrengthening the military power, to confirm the royal prerogative.—If

GREAT BRITAIN,

According to preſent appearances, ſhall be dragged irreſiſtibly into a war with Spain, it is difficult to conceive any cauſe, or any circumſtances, in which nation could contend with nation with greater glory and advantage.

1. The Engliſh nation, in maintaining their right to ſettle a colony at Nootka Sound, aſſert a right in which all mankind are concerned, and determine, in the face of the attentive world, a grand queſtion in the law of nature and nations. The earth is the common inheritance of man. Each individual has a right to poſſeſs and cultivate an equal ſhare. But where, and what the extent of that ſhare, is to be determined only by occupancy and labour. It is vain and fruitleſs to oppoſe to a maxim ſo obvious to common-ſenſe, and conſonant with univerſal cuſtom, ideal rights derived from vicinity of ſituation, or the charm of landing on a deſert ſhore, and hoiſting a flag, or erecting a column, in the name of any particular monarch. Rights, founded on ſuch circumſtances, are as indefinite in their extent as chimerical in their nature; for who ſhall determine the point to which the magical occupancy of the pillar or the pole ſhall extend? and what line ſhall circumſcribe the indefinite *parage?* Still more abſurd, if poſſible, is the idea of a right founded on a grant, four hundred years ago, by an arrogant and ignorant hierarch, whoſe munificent donations, if he had really poſſeſſed them, the acknowledged ſphericity of the earth would have turned into indelible ridicule.—Though men, by entering into ſociety, and partaking of its advantages, ſubmit their natural rights to ſuch regulations as may be eſtabliſhed for the general good, yet they can never be underſtood to have wholly renounced them. An equal ſhare of land is the birthright of every

every man: though he may exchange that right for the benefits of living under the artificial reſtraints of ſociety. In the preſent queſtion we ſuppoſe, what may be in fair reaſoning, the caſe of all mankind, at any given period, viz. being ſet down on the earth at the ſame time, by the hand of their common parent. In this caſe each individual would undoubtedly have a right to a fair portion of the ſoil not to be alienated but by an expreſs compact in mature age, after having been, or having had a free opportunity of actual poſſeſſion.—Now, what individuals are to individuals, in a ſtate of ſociety, an independent nation is to an independent nation. If any ſtate, then, feels itſelf to be circumſcribed, it has a right to a ſettlement wherever it can acquire it without treſpaſſing on ground already appropriated by pre-occupancy and labour. The Engliſh nation, therefore, have a right to poſſeſs as much of the deſert coaſt of America as they can cultivate; and no more. If any other European colony chuſes to ſettle in their neighbourhood, they have not any title to diſpoſſeſs them. As to the policy of colonizing

NOOTKA SOUND,

that is a queſtion which may, perhaps, admit of doubt. After the laſt peace, by which we gave up our pretenſions to the ſovereignty of America, it was the faſhion to ſay, that we were well rid of it. Many treatiſes were written to prove our loſs in ſuſtaining, nurſing and protecting our American colonies; and in reality it ſoon appeared that after we had loſt our excluſive trade with America, that general ſpirit of induſtry and enterprize, and thoſe capitals and commercial habits which diſtinguiſh England, found other and more productive channels.—Shall we boaſt of our advantages in giving up a tree in full bearing, and fight for the property of a plant? But, in candour and truth, the national honour of Great-Britain ought to be ſupported: and in this point all parties are happily and glorioufly agreed. Great and wiſe governments have always been jealous of national glory: it is an active principle which, properly cultivated, diffuſes throughout every branch of the ſtate the vital energy of virtuous actions.

2. GREAT-BRITAIN, in maintaining a conflict with Spain on the preſent ground of quarrel, appears foremoſt among the nations, on the ſide of liberty. The Leaders of the Houſe of Bourbon make war for the purpoſe of drawing off the awakened and awakening ſpirit of their ſubjects into new channels, from whence it may be evaporated by the effuſion of blood: and with the flower of the nation, called to arms, intend to turn theſe, after peace againſt the juſt claims of the people. Britain is placed in a ſituation in which it becomes equally her duty and intereſt to proclaim to the Spaniſh nation the deſigns of the FOREIGN family and councils by whom they are now governed.

It will be good policy to declare in our manifeſtoes, that we wage war, not with the nation but with *the court*, and that we will refer much of the matters in diſpute to the judgment of the CORTEZ.

3. The rich and widely-ſcattered dependencies of the Spaniſh monarchy, and the nature of their national wealth which expoſes it to invaſion at ſea, preſent to a great maritime power, ſuch as England, an inviting opportunity of carrying on a predatory war, which muſt be ill-conducted indeed if it does not, at leaſt, ſupport itſelf.—Even if the Britiſh government were wholly ſilent and inactive, there is at preſent ſuch a maſs of wealth, and ſo high a ſpirit of enterprize, among the trading people of England, that the Spaniards, ſingle-handed and unſupported by any other powers, would in the end be vanquiſhed and driven from the ocean by Britiſh privateers, or letters of marque fitted out by private adventurers.—Military as well as naval adventurers, as in the reign of Queen Elizabeth, might happily unite their private reputation and fortune with the public proſperity and glory of their country.—Certain projects that were formed, on very probable grounds of ſucceſs, in the late war againſt the Spaniards, but never carried into execution, might be reſumed with greater advantage.—The 98th and the 100th regiments, conſiſting of 1000 men each, and raiſed by Colonel Humberſton and Colonel Fullarton, were originally deſtined by Lord George Germaine, according to a plan of Fullarton's, to be ſent to India, there to be joined by a number of laſcars and ſepoys and ſome ſhips of force, and thence to proceed againſt the Spaniſh ſettlements in South America. But, on the appearances of the Dutch war, an attempt was projected againſt the Cape of Good Hope. And to this laſt, adminiſtration gave the preference, which promiſed to have ſhaken the Spaniſh empire in the ſouthern hemiſphere *.

It may, at firſt ſight, and we underſtand that it is in fact very generally ſuppoſed, that the Spaniards will never be ſo mad as to carry their threats of war into execution. It is ſcarcely worth while to indulge ſpeculation on a point which muſt ſo ſoon be determined.

MOTIVES OF SPAIN.

We ſhall only obſerve, that neither are there motives of neceſſity wanting to urge the Spaniards to arms, nor *rays of hope*, at leaſt, to invite them. Not to inſiſt farther on the ſcheme of compoſing internal diſſention by foreign war, we may obſerve, that the Engliſh have eſtabliſhed a colony in Botany Bay, and a fiſhery near the coaſts of Chili. They now take poſſeſſion of Nootka Sound: nor will this, the Spaniards may naturally ſuppoſe, be the laſt of their enterprizes in thoſe quarters.—Other nations, the Dutch, and Danes, and Swedes, if a timely check

* See memoirs of the late war in Aſia.

is not given to the growing evil, may follow their example. The Spaniards, ſurrounded and intermixed with ſo many maritime powers, would loſe their authority in South America,—without which, ſince the decline of their induſtry and population in Europe, they are nothing. The king of Spain, therefore, is impelled to fight for an excluſive right to what is little better to him than a *terra incognita, tanquam pro aris et focis.*

AGAIN, it is more than probable that the Spaniſh monarch is ſecretly aſſured of the ſtrenuous co-operation of the great northern powers, as well as of whatever aid can be ſpared by France, Naples, and Sardinia. Neither the Auſtrians nor Ruſſians, it is true, can afford any material aid by ſea, but they may damp and check much of our naval exertion by invading Hanover, and the dominions of our continental allies, and by threatening to invade, if not actually invading Great-Britain.—An invaſion, let it be obſerved, is not, as is by many ſuppoſed, to be prevented by the ſuperiority of our fleet, While the Engliſh navy is kept at bay by the combined fleet, we ſhall ſuppoſe, of Spain, France, Venice, and Ruſſia, a thouſand tranſports land men on the coaſt of Britain. The liberty and political independency of Great-Britain, we cheerfully grant, is not to be ſubdued by foreign invaſion. But why may not projects of invaſion be formed now by the Auſtrians and Ruſſians, as well as formerly by Charles XII. of Sweden?

Farther; a ſpirited attack on Great-Britain by Spain, would produce a general war in Europe. But the iſſue of war is extremely uncertain; and the crown of Spain, tottering on the head of a young and ambitious ſovereign, may be fixed, not loſt, by an appeal to arms.—If

A GENERAL WAR

ſhould indeed take place, a more magnificent, or rather, if we ſuffer ourſelves to reflect on the miſeries of war, a more awful ſpectacle will be diſplayed than was ever diſplayed to the world. The ſcene of action will be more extended, the parties contending more numerous, the ſtratagems and machinations of war more various and effective. No quarter of the globe, and ſcarcely any kingdom in Europe, will be unengaged in the wide conflict. On the one ſide, we may arrange

TIPPOO SULTAN,

Who has already commenced war on our good ally the King of Travancore, the French, the Spaniards, the Italians, the Auſtrians, with their German allies, and the Ruſſians; on the other, Turkey, Sweden, Holland, Poland, the Pruſſians, with their German allies, Great-Britain, and probably the Anglo-Americans, between whom and the Spaniards there are irreconcileable cauſes of oppoſition and diſcord. Who are to be the great leaders on either ſide, to give the general impulſe and direction to the confederacies, cannot, at this moment, be aſcer-

tained; though it would have been impoſſible to err in our conjectures and anticipations relative to one of them, before the death of the late Pruſſian monarch. How great a part would Frederic have had to act on this grand occaſion! Though nothing was wanting, either to the meaſure of his years or his glory, yet our imagination delights to dwell on the idea of the great politician, philoſopher, and hero, at the age of eighty, by his counſels and arms, ſaving the Turkiſh empire, which, about thirty years ago, would ſcarcely deign to enter into a negociation for the ſalvation of Pruſſia, reſiſting the confederacy among the great continental powers, and maintaining the liberties of Europe!——While

THE NATIONAL ASSEMBLY OF FRANCE

Are buſied in ſettling a new order of affairs, the proteſtants of Montauban, and many other ſufferers, confeſs the ſupreme bleſſing of eſtabliſhed government of ſome kind, and with tears of blood deplore the preſent interregnum. The Aſſembly have, by aſſuming the power of making peace and war, reduced the grand monarque to the ſituation of the Ram-rajah of the Marattas; a nominal king, wearing royalty in fetters. The reſult of this act who can prognoſticate? What foreign power can treat with twelve hundred men? or how can twelve hundred men give unity and conſiſtency to the operation of internal government?

NETHERLANDS.

The counter-revolution that is threatened in the Netherlands by the vigorous preparations of the Auſtrians, and the diſunion of the ariſtocratical and republican parties, occaſions the leſs regret among all moderate men, that the ſtates aim plainly at the eſtabliſhment of themſelves into a number of petty ſovereigns, or, as a Greek or Roman would have ſaid, of tyrants. Who, without indignation, can behold the treatment of VANDERMERSCH, the ſaviour of his country, confined in the citadel of Antwerp? What friend of human nature but is anxious for his ſafety? What reaſonable man, that contemplates his ſituation, but muſt acknowledge that the tyranny of ariſtocracy is equal to that of a ſingle deſpot!

ENGLAND.

Amidſt all the viciſſitudes of human affairs the Britiſh parliament is regularly diverted, once every week, from the laudable and important buſineſs of the political *epopæia* to that everlaſting epiſode the trial of

MR. HASTINGS.

General Burgoyne complains that Major Scott has brought a railing accuſation againſt what was determined by a majority of the Houſe of Commons. The Major ſhews that there is nothing more common than for Mr. Fox, Mr. Burke, and other leaders

leaders of oppoſition, to arraign deciſions of the Houſe of Commons with the greateſt freedom. This *argumentum ad hominem* is unanſwerable. It is rather unfortunate that General Burgoyne ſhould have ſtood forth as an indirect proſecutor of Mr. Haſtings. Is there no character in which Sir W. H——e or Sir H. C———n could appear in this comedy? It is now neceſſary to introduce ſome new actors, for it has confeſſedly degenerated, in the hands of the preſent manager, into a moſt miſerable monotony. How long ſhall we wait for its termination? till Mr. D——s ceaſe to worſhip the powers that be! Mr. P—tt have no private views to ſerve by haraſſing the ſaviour of India! Till Mr. Wyndham is unable to make a logical diſtinction! Mr. Fox incapable of turning an argument into different modes and forms! and Mr. Burke of inventing new analogies, and making amuſing digreſſions!

Ruſticus expectat dum defluat amnis at ille
Labitur et labetur in omne volubilis ævum.

To CORRESPONDENTS.

☞ *We return the Rev. Mr.* Vince *our thanks for his very polite letter. We were miſtaken in the price of his Treatiſe on Practical Aſtronomy, it being only* 15*s. At the ſame time we cannot retract what we have ſaid of his account of Vernier's ſcale. We do not deny that ſuch a diviſion as he deſcribes might exiſt; but, with all ſubmiſſion to our reſpectable author, we maintain that it would not be accommodated to practice. If the difference between the two ſcales were expreſſed, as he aſſerts, by the fraction* $\frac{1}{n.n+1}$, *the diviſor would be the product of two contiguous numbers, an even and an uneven. But it is obvious that this contrivance would admit of a very limited application. There are no two adjacent factors, for inſtance, of the numbers* 60, 100, 500, or 1000; *and it would therefore be impoſſible, by Mr.* Vince's *method, to divide the unit into theſe parts, though nothing is more common in the ſubdiviſion of the degree or the inch. The denominator of the fraction* $\frac{1}{nm}$, *which we have ſtated as the difference between the parts of the proximate ſcales, is produced by the multiplication of any two factors indiſcriminately, and conſequently offers a great variety of choice. We ſhall confeſs, however, that our analyſis is but a novel attempt, and that our age and ſituation have afforded but few opportunities of examining aſtronomical inſtruments.*

☞ *Communications for* THE ENGLISH REVIEW *are requeſted to be ſent to* Mr. MURRAY, No. 32, Fleet-ſtreet, London; *where Subſcribers for this Monthly Performance are reſpectfully deſired to give in their Names.*